

# **THE RECONNECTION OF THE BUILT FORM TO THE NATURAL ENVIRONMENT**

Towards an Ecological Awareness Centre for Durban

By  
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## **DECLARATION**

I hereby declare that this dissertation is my own unaided work and carried out exclusively by me, except where otherwise acknowledged. It is being submitted to the College of Humanities, School of Built environment and Development Studies at the University of KwaZulu-Natal, in partial fulfilment of the requirements towards the degree of Master in Architecture. This dissertation has not been previously submitted for any examination or degree at any university.

Signed:

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## DEDICATION

This dissertation is dedicated to my parents, for their love and encouragement during this quest for knowledge.

*“And if the true problem is acknowledged- that of our social arrangements, then we’ll be able to see our alienation from nature as a failure, for nature shouldn’t be shaped around our needs but we should strive towards a harmonious co-existence”*

(Katz and Kirby: 1991: 263)

## **ABSTRACT**

The research conducted seeks to understand man's relationship with the natural world, and the translation of that relationship into the built environment. Current and contemporary built form often lacks an integrated approach to the natural environment. Seeing as modern man's lifestyles is increasingly focused on indoor activities and governed by the technological rather than the physical world, the disconnection between man and the natural world grows ever more, with great physical, social and mental repercussions. The research therefore aims at establishing how the built form may facilitate connections to the natural world.

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## CHAPTER: 1 INTRODUCTION

### 1.1 INTRODUCTION

#### 1.1.1 Background

Implicit in current architectural debates is the criticisms over the lack of cohabitation with the natural environment. Built environments of past could be seen to have had an innate sense of cohesion with the natural environment, however contemporary built environments reflect a disengagement with the forces of nature, as our cultures, communications and technologies have evolved (Beathly, 2011: 1-2). While technological advancements have benefited man tremendously, especially in the fields of medicine and communications, it has also created problems which affect both the earth's ecology and human health. This notion is recognised by authors such as David Pearson (2005), Malcolm Wells (1981), William McDonough and Michael Braungart (2002).

Ian McHarg (1992:31) highlights that man's life in sickness and in health, is integrally connected with the forces of nature. Instead of natural environments being opposed and conquered, should rather be treated as an ally and friend, whose ways must be understood and whose counsel must be respected. Modern day lifestyles however, are increasingly centred on indoor activities, limiting interactions with the exterior world which are at most times only engaged with through the sense of sight (Beathly, 2011: 1). It can be deduced that architecture acts as an enabler of certain lifestyles and as such plays a vital role in promoting lifestyles integrally connected with the natural environment, for the benefit of human wellbeing.

Christopher Day (2004: 13) declares that architecture has profound effects on human beings, place and human consciousness and due to these implications architectural design is far too important to be limited to the visual sphere. Instead architecture should be a field of study which goes beyond the practical, as it has a far greater social and ecological impact. Architecture should therefore be actively worked with to provide spaces which promote learning, healing, reflection, and positive social engagement.

Human experience of space as related by Juhani Pallasmaa's *Eyes of the skin* (2005), is a complete bodily experience and is not a purely visual experience, as is often focussed on. Through this understanding, architectural responses should take into cognisance the experience of space which responds to the intangible, perceptive qualities of the natural world

such as the genius loci or sense of a place. According to David Pearson (2005: 10) the genius loci of a place is often overlooked in developing towns and cities, as developers seek to maximise on economic opportunities, favouring building methods which often deny the natural site and dominate the landscape with man-made elements. It is important to address these issues for the creation of architectural landscapes that reflect a considered, sensitive approach to natural environments. Such approach to the natural environment enables human interactions with man's natural heritage and captures the essence of the place, rather than impose on it objects which appear alienating and lack meaning.

In a world that has grown rational, cold and has lost much of its meaning, architects and designers are looking back to ancient archetypes for inspiration. With the trend of globalisation, it is becoming increasingly more important to promote diversity and diverse value systems as found in the natural world. Coy Harword fittingly declared: *"Our major task as architects is not revolution but the poetic preservation of diversity. To do this we must resist the domination of one value system over the other."* (cited: Spellman, 2003:38).

The dissertation is aimed at understanding the afore mentioned issues, towards the proposal of an ecological awareness centre for Durban. Durban, on the East Coast of South Africa, has placed great emphasis in exploring opportunities for engagement with the natural environments and creating a society that is ecologically aware, as noted in the various ecological initiatives endorsed by the city's municipality. The Ecological Awareness Centre shall provide space for the city's residents to engage with the issues of the ecological world and will allow for opportunities to partake in initiatives which uplift the natural environment. Through various activities related and inspired by the natural world, awareness and sensitivity to our natural environments can be achieved. The natural world provides man with diverse and inspiring spaces, which should be celebrated and understood.

### **1.1.2 Motivation**

It is vital to acknowledge that man is an emotive and spiritual being, who is influenced by the world around him. Man's life occurs primarily within the built environment, which must facilitate in promoting man's physical, mental and emotional wellbeing. Studies have shown that cities and the increase in technological interfaces, while benefiting man in providing efficiency, has resulted in an increase in respiratory and stress related illnesses. On the other hand, spaces that actively promote life-sustaining environments are found to have a positive

impact on man's physical and mental wellbeing (Almusaed, 2011; Beathly, 2011; Day, 2004; Mcharg, 1992).

Disconnection from the natural world leads to a society that lacks understanding of the interconnectedness of everything on the eco-sphere, including man and nature. Such disconnections have tremendous repercussions on the biological world of which man is a part of. Thus respect, sensitivity and awareness of the natural world must be instilled within society, if we are to protect the future of the ecological world. The proposed Ecological Awareness Centre shall act as a device that enables such awareness and evoke love and respect for the natural world.

## 1.2 DEFINITION OF THE PROBLEM, AIMS AND OBJECTIVES

### 1.2.1 Definition of the Problem

At present, man-made environments often dominate and segregate natural environments as had been advocated by the modern movement. However, this attitude of negation towards the natural environment and its forces has led to ecological and human wellbeing problems. While man has existential needs of expression and progress, there is a need to respond to man's innate need of connections with natural forces which man is integrally related with and dependent on.

### 1.2.2 Aims and objectives

The aim of this dissertation is to suggest guidelines towards the creation of man-made environments which positively interact with the natural environment, for the wellbeing of man and the natural world. The objectives of the study are as follows:

- To explore ways of facilitating harmonious integration between man-made and natural environments
- To explore ways wherein physical, psychological and social wellbeing is promoted through the creation of spaces that are in equilibrium with the natural environment
- To explore ways in which buildings can respond to man's personal needs of shelter, relief, comfort and expression while connecting to natural forces as found in the natural environment.



## 1.3 SETTING OUT THE SCOPE

### 1.3.1 Delimitation of Research Problem

The research will pursue the understanding of the interaction between the man-made environments and the natural environment, in particular its implications on physical, social and ecological wellbeing. It shall not deal with political or economic factors. Where sustainability shall be discussed, it will deal only with ecological sustainability as other factors are beyond the scope of this research and is not the focus of this research.

### 1.3.2 Definition of Terms

*Natural environments*: natural environments encompasses all living and non-living things occurring naturally on earth.

*Natural Flows*: Flows as found in natural environment and natural systems, such as air flows, ebb and flows of the sea etc.

*Built environments*: buildings and structures made by people, as opposed to natural features

*Passive systems*: those systems which are not reliant on energy sources such as fossil fuels also referred to as low- tech solutions

*International style*: the architectural style employed by the modern movement that promoted an architectural aesthetic which could be transferred onto any site irrespective of country or climate.

*Genius loci*: spirit of place or sense of place

*Haptic*: sense of tactility

*Human scale*: dimensions of things in relation to human proportions

*Ecology*: the relationships between living organisms and their interactions with their natural or developed environment (Encarta dictionary)

*Globalisation*: the widespread of one value system over all others

*Flow*: a state between boredom and overstimulation characterised by immersion, awareness, sense of harmony, meaning and purpose (Ellin, 2006: 11)

### **1.3.3 Stating the Assumptions**

It is assumed that there is a dominance of the man-made over the natural environments in present architectural landscapes. If addressed it shall help in providing healthier environments for human habitation.

### **1.3.4 Key Questions**

Primary question:

How can a harmonious reconnection to natural environments, in our current and emerging architectural landscapes, be established in order to create meaningful uplifting architecture and landscapes?

Secondary questions:

- How can the natural environment inform the built environment?
- How can aspects of nature be integrated into the built form?

### **1.3.5 Hypothesis**

To uplift and promote man's humanity and human wellbeing, integral connections with the natural environment through architectural space making is needed.

## **1.4 CONCEPTS AND THEORIES**

### **1.4.1 Place theory**

Place theory is based on the speculation about culturally determined understanding of places in the natural and built world, which explores man's need to permeate places with qualities that go beyond the practical and immediate necessities (Crowe, 1995: 73). The nature of the character which a community layers upon its environment is directly related to their understanding of the environment. This notion is central to concepts such as phenomenology and critical regionalism, which deals specifically with the idea of "place" making.

Phenomenology of place as defined by Christian Norberg-Schulz (1980) is a theory which puts forward the view that each place or environment has a character which may not be explained through scientific data. Among the factors that contribute to the character of the

place are environmental, socio-cultural and economic aspects. The area of concern to this research study is that of the environmental factors which directly contribute to defining the character of places. Sensory experiences of space which are related to environmental conditions are explored within the concept of phenomenology which enhances the grounding of the spatial experience to a space which is connected directly to specific place (Zumthor, 1999: 9-11). The understanding of the above mentioned concepts gathers meaning to built environments as they directly converse with the natural conditions. Similar concepts of place bound architecture can be found in the theory of critical regionalism.

Critical regionalism is a concept which seeks an architectural synthesis between nature and technology and proposes a resistance to the homogenization of the built environment which is a result of modern building technology. It pursues a balance between the paradox of being part of a global world and the notion of local identity. The use of local materials, craftsmanship and the responsiveness to light and climate are significant aspects of critical regionalism, thus creating aesthetically differentiated buildings which are ecologically responsive. (Nesbitt, 1996: 486-489)

#### **1.4.2 Postmodern ecology**

Emerging architectural theories regarding ecology in response to modernism and post modernism may be classified under the broad theory of postmodern ecology. The beginnings of postmodern ecology can be seen in the works of Frank Lloyd Wright, Luis Sullivan and Hans Schouron, to name a few, in the nineteenth century. Organic concepts were utilized, although mainly on a formal level, dealing with issues of structure, form and composition (Gans, D & Kuz, Z, 2003: 10). Other concepts which have emerged within this field of post-modern ecology include biophilia and ecological theory.

Biophilia, a concept coined by Edward O Wilson (1984), proposes that human beings subconsciously seek connections with nature. Biophilia in architecture refers to the creation of spaces integrally related with nature which enhances human responses and physical wellbeing. Concepts symbiotically related to the natural environment and local ecology is key in the creation of biophilic architecture. Expanding on the idea of ecosystems and symbiosis is the concept of ecological theory.

Ecological theory is one that establishes buildings as part of a larger “ecosystem”. This concept can be seen in the writings of William Macdonough and Michael Braungart (2002) as well as by Herbert Girardet (1992). It asserts the notion that buildings should be conceived as part of a larger ecosystem rather than individual objects within a landscape. Through this understanding of the built world, both man-made and natural environments merge into one, and life cycle systems become cyclic as opposed to current linear systems.

## 1.5 RESEARCH METHODS

A systematic approach to the collection and analysis of data is established in order to suggest recommendations to the questions and issues as inferred by the topic. The research methodology used is a qualitative research, as it seeks to understand the intangible character which nature may introduce within our built environments. Both primary and secondary data collection is employed as outlined below.

The foundation of the research lies upon secondary data collection in the form of a literature review, which investigates previous insight into issues as inferred by the topic. Appropriate books, websites, journal articles and precedents are utilized for the compilation of this section. Relevant concepts and theories are explored, and applied to the analysis of primary data. This section of the research will produce a theoretical framework, which shall serve for the analysis of primary data. Furthermore key precedents are conducted to illustrate concepts explored in the literature review.

Primary data collection is through, case studies, blueprints and interviews. The collection of this data tests the theories explored in the literature review, under real world situations and explores its relevance, its successfulness and its failures. Three case studies is carried out by engaging directly through observation of space, site visits, architectural reviews of space making and planning issues, photographs, measurements and interviews where possible . This illustrates and tests the application of the architectural theories as set out in the literature review. The case studies of specific buildings is selected so as to represent theories and concepts as outlined in the literature review, which illustrate ways in which integrated response to nature may be achieved in the built environments. Three case studies are conducted, firstly the Ixopo Buddhist retreat which looks at a building in a natural setting, the second the Green Hub at the Umgeni River Estuary located in a complex urban setting, and

the third Binder Dijker Otte House (here to referred as B.D.O House) in Ridgeside office park Umhlanga, representative of emerging contemporary designs. The variations of settings and functional aspects allows for the study to assess the degree and level of nature connectedness which is achievable in various contexts.

Interviews with users, where possible, of the space regarding the case-studies were conducted in order to obtain data from the perspective of the users, so as to gain an understanding on their experience of the space, unhindered by theory. The sample of individuals interviewed for the case studies is mainly staff of the various case studies. This approach is taken as the staff have utilised the space over greater lengths of time in varying conditions and therefore have greater knowledge on the buildings and space in question. Additionally key respondent Brain Johnson was interviewed, a professional within the field of architecture, whose life research is based on anthroposophic architecture, a field which explores creation of space in relation to man and moulding space to evoke positive human responses. Such approaches to architecture explore themes of nature and connection to the natural world. Furthermore, correspondence with architect Louis Van Loon was conducted to acquire additional information on the Buddhist retreat centre. It is to be noted that full access to BDO house was limited, though the main spaces were allowed to be observed.

The case studies are analysed through the theoretical framework as established through the literature review. Critical analysis and discussions of both primary and secondary data sources in its entirety was conducted, to gain a comprehensive outlook on responding to the predicament of integrating natural and man-made environments. Finally conclusions and recommendations are established.

## 1.6 CONCLUSION

The above section outlined the problems, aims and objective of the study and set out the research methodology which is followed in order to conclude towards guidelines and recommendations. The following chapter shall present relevant theories and concepts which are explored to provide a theoretical framework. The theoretical framework provides concepts towards the creation of a harmonious reconnection to the natural environments.

## CHAPTER: 2 LITERATURE REVIEW

### 2.1 INTRODUCTION

The relationship between man, the natural environment and the built environment is one that is complex and inter-related. This chapter sets out to gain an understanding of the role of architecture in facilitating connections to the biological world. Due weight shall be given to concepts, theories and paradigms that seek to establish said connections. The discussion falls into three parts namely:

*Man, nature and the built environment:* this section explores the relationship between the three spheres, in order to establish a perspective from which the forthcoming research may build upon. Furthermore, this section reveals how the natural environment may influence the built environment.

*The city and the natural environment:* this section focuses on the city and discusses urban design philosophies which seek to marry the benefits of living in the city with the serenity of nature. Additionally it explores the art of the creation of spaces within the city which enhances the quality of life.

*Natural environment and architectural design:* this section explores ways in which architectural design may incorporate and facilitate connections to the natural world. Concepts such as biophilia, building biology movement and phenomenology of the senses are explored.

### 2.2 MAN, NATURE AND THE BUILT ENVIRONMENT

#### 2.2.1 Origins of the built environment and perceptions of man and nature

*“Architecture, with all its varying phases and complex developments, must have had a simple origin in the primitive efforts of mankind to provide protection against inclement weather, wild beasts and human enemies.”* Sir Banister Fletcher (Fletcher, 1924:1)

The above statement reveals to us the primary reason for which architecture arose: for the provision of shelter, providing man that which the natural environment could not. However man is dependent on both the man-made (built world) and the natural environment to fulfil his needs for survival. Man is primarily dependant on nature for resources such as food and water, and is dependent on the built environment for fulfilling his needs of shelter and relief from the natural environment. The built form is related to the natural environment, using its resources and shaping habitable spaces for man, thereby altering the natural environment.

Thus the relationship between man, his built environment and the natural environment is influenced mainly by man's needs. This inter-related system of man, nature and built-form is illustrated below (Figure 1).

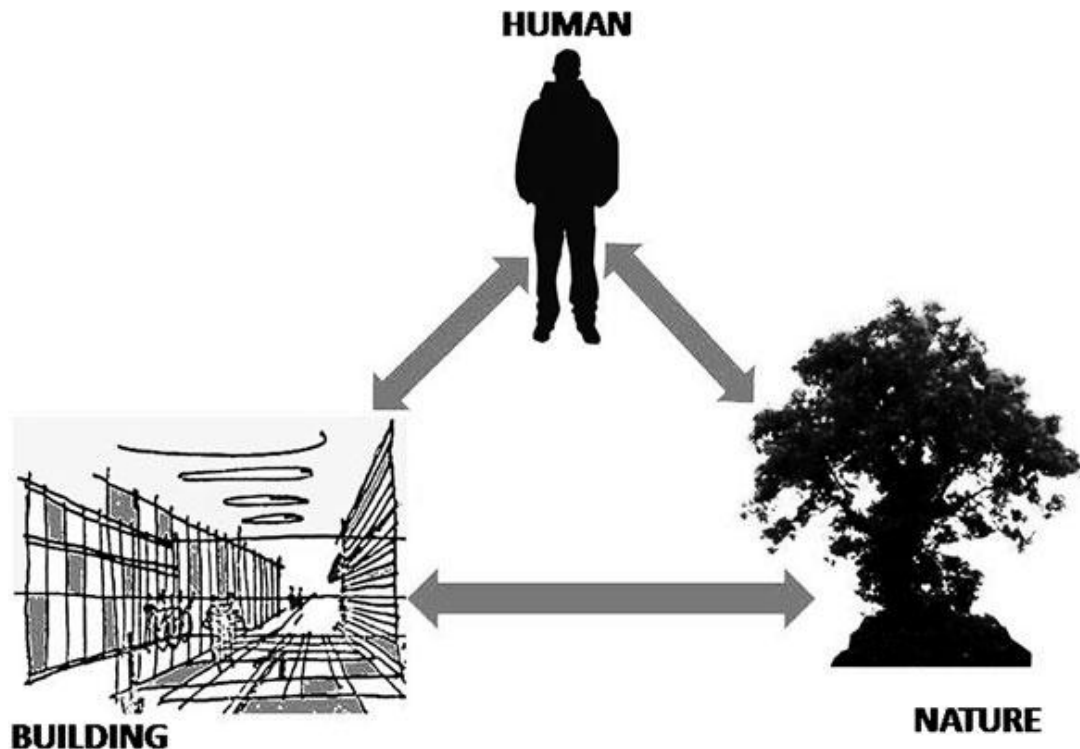


Figure 1 The relationship between man, built form and nature (Almusaed, 2011)

Crowe (1995) highlights man's inter-relationship with the natural environment stating:

*"...Nature, as our first environment, was our primordial source of external knowledge and the subject of our speculation about ourselves in relation to all else. By the extension of our imaginations, we created our cosmologies from what we observed first hand in nature: life and death, the passing of days and the seasons..."* (Crowe, 1995:4)

Through the understanding of the natural environment, man established himself and revealed his presence in the world by creating places, often through the geometric shapes which is human nature (Crowe, 1995: 4). Over the passage of time, as cultures of man evolved, the understanding of the relationship between man and nature grew in complexity, as man sort to dominate over nature as opposed to maintaining a balanced equilibrium.

The understanding of nature by many is one that often perceived to be untouched wild landscapes of forests etc. separate and untouched by humans. The man-made world on the

other hand, is set apart by culture and technology giving order to life (Weinstock, 2010: 13-14). This distinct contrast between man and other species is the idea that drove the focus of the conservation ideology of the 19<sup>th</sup> century, which pushed for the isolation of natural environments and the man-made, as an attempt to protect nature (Macy and Bonnemaïson, 2003: 2-3).

The perception of nature undisturbed, as a state of perfection is one which is reinforced by ancient myths of paradise, whereby “nature created by god, was beautiful and divine, and sin entered the world only through human corruption.”(Weinstock, 2010:14). This concept is one that persists today in the distinction which is commonly made between the purity of virgin nature and the depredations of technology. An opposing paradigm proposes that mankind was created for the perfection of nature and the natural world is therefore for the benefit of man. The idea of man dominating nature then becomes sanctified (Weinstock, 2010: 11). This dominant attitude towards nature was witnessed during the industrial revolution. This period encouraged the free exploitation of the natural world, thereby distancing man from the natural environments (Mc Dounough, W & Braungaut, M, 2002: 6).

The above mentioned attitudes towards nature represent the polarities in the perception of nature in relation to mankind. Francis Bacon (1620) proposed an alternate ideology whereby, nature together with human beings and their artefacts are part of the natural system. His proposed study of nature included things artificial, as works of mankind was the manipulation and therefore an extension of nature (cited: Weinstock, 2010: 10-11). Three centuries ago Blaise Pascal pondered over similar thoughts:

*“But what is nature? For is custom not natural? I am much afraid that nature is itself only a first custom, as custom is a second nature.”* (Cited: Crowe, 1995:6)

Weinstock (2003) and Crowe (1995) concur with the notion of humans as part of the natural system, just as other social species within the animal kingdom are. However it is important to note that humans are fundamentally different in their quest for knowledge and the rate of technological progression. This results in the evolution of human forms and artefacts at a faster pace than that of other social species.

It may be argued that our quest for progression at such rapid rates may have resulted in a digression as older more well suited systems of construction are lost. Crowe (1995: 21-22) points out that while humankind has become more aware of the interconnectedness of all



things in the world and nature, it has not generated any solutions towards the current environmental concerns. To the contrary it has added towards the problems faced. Moreover man's reliance on analytical tools and numbers exclusively has further distanced us from the natural world, our beliefs and existential needs (Crowe, 1995: 22). Solutions in regard to environmental problems and connectivity to our natural world are typically technological, seeking to refine the technologies which have, in most instances, caused such environmental problems in the first place (Crowe, 1995: 24). Therefore a more diverse method is needed in addressing these problems, which looks at subtle human evaluations and intrinsic values as well as technological solutions.

### 2.2.2 Human factors and the built environment

The built environment provides man with a backdrop upon which life plays out and can be conceived as a tool which facilitates the activities of human life. Seeing as man is a complex being, there are both functional and emotional requirements that the built environment should respond to. Functional spatial requirements are often activity specific and are governed by the technical requirements of space, while psychological requirements respond to the qualitative feel of the environment in relation to man.

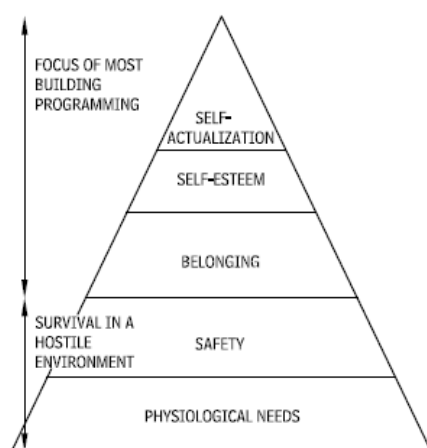


Figure 2 Abraham Maslow pyramid of needs (media.wiley.com)

Abraham Maslow's (1943) pyramid of needs describe human needs (Figure 2). Maslow suggests that the hierarchy of needs is a constantly evolving process, such that when one need is satisfied another (found above it) is required to be fulfilled (media.wiley.com). The collaboration of man in the form of towns and cities are found to fulfil man's basic needs of belonging, safety and physiological needs, while man's personal needs are often addressed through interior spaces of the built environment (media.wiley.com).

Many studies done in the field of environmental psychology confirm the ability of architecture and the built world to influence man's actions and his emotional and physical wellbeing (Day, 2002: 4-5). Studies carried out by David Carter and Terrence Lee's *Psychology and the built environment* (1974) found that positive emotions are often

associated with life sustaining environments as opposed to those which lack natural life. Furthermore E.O Wilsons (1984), biophilia theory suggests that the psychological connection to the natural environment is one which is an innate human need.

Inherent in current architectural debates are the criticisms against the attitudes and values, by which most of the built environment has been produced over the years, leading to social alienation and environmental depredation (Salamaa, 2007: 4). This is mainly due to emphasis given to materialist, economic and scientific philosophies, which ultimately leads to the sterilisation of the spiritual, creative and psychological domain (Johnson, 1993: 23-24). An approach to space making therefore needs to be considered holistically in synthesis of physical and psychological influences and its impact on the greater human context.

Architects such as Rudolph Steiner propose that human forms take lessons from the natural environment and move towards a paradigm which is less scientifically based. In this manner architecture develops in accordance to man's intrinsic values. This approach cultivates man's sensitive qualities to his environments and nurtures values that are rooted in the wellbeing of the human race and planet (Blaser, 2002: 6-7). Such approaches promote a conversation with the natural environment rather than an imitation of nature. Methods that interpret natural systems are utilised, striving towards producing architecture which provides similar dynamic life influences as found in the natural world (Blaser, 2002; Day, 2004). Life enhancing architecture is needed as opposed to machine like architecture as found in contemporary and modern design aesthetics. Sim Van der Ryn and Stuart Cowan concisely explain:

*“It is time to stop designing in the image of the machine and start designing in a way that honors the complexity of life itself ... we must mirror nature's deep interconnections in our own epistemology of design.”* (Cited: Ellin, 2006:11)

The above discussions highlight the role of architecture in promoting human values that must be considered for the gain of the greater whole. Seeing as human values are culturally and place specific it can be deduced that the ideal relationship between the man-made environment and the natural world cannot be specified to a general rule (Crowe, 1995:8). Rather the understanding of place is integral in connecting the built to the natural environment, in response to man's cultural values and human needs.

### 2.2.3 Man and the idea of place

The natural environment, where-upon the man-made is situated, has within it qualities and characteristics which influences the decisions determining the built form. Phenomenology of place and *genius loci* are concepts within the broader place theory that seek to provide architecture with a theoretical bases upon which the metaphysical character of space may be explored and concretised (Nesbitt, 1996: 414-415). These concepts are in response to what Christian Norberg-Schulz (1980: 21) identifies as, the modern movement's failure to take into consideration some of the more essential qualities of architecture.

Among the features found in the natural world is the sense of place, also referred to as its *genius loci*. This sense of place is something that is generally recognisable. It refers to the character of the space. According to Christian Norberg-Schulz (1980: 8) *place* can be defined as the "total qualitative phenomenon" which cannot be reduced to any of its properties without losing the essence of the place. The notion of qualitative totalities is proposed as quantitative methods cannot describe the essence of a place, as these methods would abstract from the place only specific information (Nesbitt, 1996: 415). Therefore a holistic qualitative approach of gathering the essence of space is called for. Juhani Pallasmaa (2005: 9-10) explains that there are qualities of space that the body as a whole experiences and it is the holistic experience of space from which the sense of place can be understood.

Christian Norberg-Schulz (1980: 25-32) recognises, four thematic levels from which *genius loci* can be deduced, two of which are natural environmental factors, these being;

1. The topography of the earth's surface
2. The cosmological light conditions and the sky as natural conditions
3. Buildings and
4. Cultural meanings

The natural circumstances of a place are understood to be founded in the topography of the landscape as well as the rhythmic changes of light and vegetation in accordance to season and time (Norberg-Schulz, 1980: 25-32). These rhythms of nature provide a varying atmosphere that brings life to a landscape. This is the *genius loci* as a place in the natural world, which needs to be confronted when constructing the built environment.

Often places are given human qualities to denote the character of its space. Things in the landscape take on meaning when we reference them, for the purpose of orientation; we sense the essence of the landscape before we rationalise them (Crowe, 1995:73). The sense of place within the natural landscape can be distinguished to three basic categories according to Christian Norberg-Schulz (1980) as is defined below:



Figure 3 Romantic landscapes (sirismm.si.edu)

*Romantic landscapes:* this refers to landscapes which are rich and varying in character, rich in vegetation and is characterised by “an indefinite multitude of different places.”(Norberg-Schulz, 1980: 42). Here the original forces are strongly felt.



Figure 4 Cosmic landscapes (www.graphicshunt.com)

*Cosmic landscapes:* refer to landscapes which are monotonous or lunar in nature and can be recognised by the following factors: Earth does not provide foothold, there are no individual places structured and the sky is structured by the sun rather than the earth. (Norberg-Schulz, 1980: 45)



Figure 5 Classical landscape (www.homebaseabroad.com)

*Classical landscapes:* refers to landscapes that are ordered to some extent. It is neither monotonous nor is it multifariousness. It can be recognised through the following: Intelligible composition of distinct elements, meaningful order and human and natural elements found to be in harmony.(Norberg-Schulz, 1980: 45-6)

The responses man has to the natural environment is one which is expected as if forms part of 'human nature' as a tool for ensuring survival (Weinstock, 2010: 11). According to Norman Crowe (1995: 4-5) this response to the natural environment forms the foundation upon which culture evolves. This implies that natural environments are the point of departure for cultural and social development. Christian Norberg-Schulz (1980: 35) explains man's response to the natural environment, pointing out three basic reactions, these being:

1. To structure nature to be more precise and ordered, taking cues from nature. In doing so man gains an existential foothold.
2. To complement the given situation, to add to it what it is lacking, making the environment more conducive for human habitation.
3. To symbolise his understanding of his environment, forming the bases of cultural development.

(Norberg-Schulz, 1980: 35)

The above mentioned reactions to the natural environment highlight man's primary response to the natural landscape, that being to establish an existential foothold and creating an environment conducive for sustaining human habitation. Christian Norberg-Schulz (1980: 10) suggests that buildings within a landscape act as focal elements which gather a condensed character of the landscape. Countries, regions, landscape, settlement, buildings, form a series of places with a gradually diminishing scale, with the more comprehensive natural places being on the larger scale (Norberg-Schulz, 1980: 15-16). This indicates the man-made elements within the environment focuses the character of a place, as man "receives" the environment and makes it focus on the building of 'things'. The 'things' thereby explain the environment and make the character manifest. Thus the things themselves become meaningful (Nesbit, 1996: 421).

The above mentioned philosophy deduced by Christian Norberg-Schulz (1980), regarding place, sets out distinguishing factors from which the essence of place maybe understood from the natural factors prevalent within the landscape. However, the translation such of essence of place into architecture is not defined. Examples cited in the writings of Christian Norberg-Schulz (1980) often refer to historic towns and cities that developed with distinct social and technological constructs in contrast to those found today (Hadad, 2010: 98). The

understanding of sense of place needs to be contextualised to the current time and space, seeing as Christian Norberg-Schulz's (1980) description of sense of place communicates a sentimental and nostalgic yearning for time past. Furthermore, Christian Norberg-Schulz (1980) tends to treat this spirit of place as if it were a quality which can be discovered and analysed in certain landscapes through insight. This method according to Richard Weston (2003:112) is dangerous, as the sense of place is subjective to people's experience of the space, the memories of the place, scents and relationships which may have occurred there. Therefore while it may have a general feel so to say, history of the place may produce varying sense of place subjective to the peoples experience in relation to the place.

The most valuable principle that can be deduced from the works of Christian Norberg-Schulz is the creation of intuitive local architecture inspired by local methods and skills which express admiration for the natural environment. Alvarado *et al* (2007:32) points out that responding to the spirit of place in this manner, which is in conversation with the local forces, results in a timeless architecture. Architectural response in line with the *spirit of time* as opposed to *spirit of place* adopts styles that does not suite local conditions and is “irrationally” derived for style sake.



Figure 6 Historic town in Southern Italy  
([www.bestsinglettravel.com](http://www.bestsinglettravel.com))

Christopher Alexander's (1979) writings conveys the contemporary struggle to understand the sense of place within urban environments which may very well be due to the adoption of global styles as opposed to locally suited responses. Those environments which convey sense of place is characterised by its organic-ness and sense of belonging to its natural environment, as can be seen in many historic cities. Alexander describes the sense of place as a “unique quality without a name” (Alexander, 1979: 19-40).

Christopher Alexander *et al* (1979) thereby developed a theory which seeks to give contemporary city spaces similar organic-ness and sense of place as is found in old cities. Among the guidelines put forward to create a sense of place are:

- placing focus on the client's role in the development as opposed to the designer and
- a system of piecemeal growth is proposed

These guidelines are characterised by their slow paced developments that are constantly evolving and changing to suite real needs as they arise. By contrast contemporary approach to urban design lies with master planning techniques which are fast paced in nature and predict needs that may arise. It is in the change from design as an evolving process to, design for a single moment of perfection whereby the sense of place in the urban environment is diminished. Nan Ellin (2006: 103-107) points out that what lacks within modern urban paradigms is authenticity. Often there is a preoccupation with the surface image of a place over process and the image becomes an end in itself. These approaches lack creativity and variety while authentic approaches on the other hand value variety and encourage creativity. Such approaches find inspiration from local culture and environments and follow a spontaneous intuitive pattern, allowing the character of place to manifest in accordance to local culture and configurations (Ellin, 2006:103-106).

Another factor which reduces the sense of place is due to fragmentations and dispersal caused by privileging the motorcar over human experience, diminishing connectedness, walkability and ultimately sense of place (Ellin, 2006: 18). It can therefore be deduced that a hybrid is needed to re-establish connectivity in respect to the user walking the city as well as car, in order to imbue the city with a sense of place without lapsing into a nostalgic time of carless cities. The human experience of space and the concept of sense of place should be given due weight in architectural design as the loss of it may result in fear, anxiety, emptiness and insecurity which ultimately affects society as a whole (Day, 2002: 3-6).

#### **2.2.4 Critical regionalism**

The challenge of current architectural design is resisting the phenomenon of globalisation. While global culture has been a great advancement for mankind it has also led to the subtle destruction of diversity and local and regional cultures (Nesbit, 1996: 470). The eradication of cultural diversity, exclusion of natural conditions or context and the exertion of a singular culture leads to a world of mediocrity and a lack of authenticity (Nesbitt, 1996: 470-471). The return to a purely regionalist, neo-vernacular approach however negates the reality of the current globalist world as Lewis Mumford (1941) aptly wrote:



*“If one seeks to reproduce such a building in our own day, every mark on it will betray the fact that it is fake, and the harder the architect works to conceal that fact, the more patent the fact will be... the great lesson of history – and this applies to all arts- is that the past cannot be recaptured except in spirit. We cannot live another person’s life; we cannot, except in the spirit of a costume ball...”* (Mumford, 1941, cited: Tzonis *et al.*, 2001: 24)

Here lies the paradox: on the one hand, there is a need for grounding architectural expression to its regional and local identity and on the other hand to take part in the modern world in order to progress. Critical regionalism, a theory coined by Tzonis and Lefaivre (1981), does not propose the nostalgic recapturing of local tradition nor does it reject it, rather a hybrid is proposed through the cross-fertilisation between rooted culture and universal methods (Nesbitt, 1996:471). This is achieved through the re-evaluation of local culture and tradition, employing modern techniques and tectonic understanding. The technique of defamiliarization is employed to abstract local ideas in a new light (Nesbitt, 1996: 483).

Kenneth Frampton (1983:26), in the article *‘Towards a Critical Regionalism: Six points for an architecture of resistance’*, highlights *Culture versus Nature: Topography, Context, Climate, Light and Tectonic form*, as one of the points which is employed to resist the domination of a universal design agenda. Here Frampton (1983) places an emphasis on the creating a conversational relationship with the natural environment and establishing methods of construction which is in tune with geographical and topographical features. This method opposes the technocratic gestures of bulldozing irregular sites, and promotes ‘grounding’ or ‘inlaying’ approach. Such approaches engage with the levels of site in order to converse with the environment and its set factors, thus allowing the peculiarities of site to find expression (Jencks, 1997: 99).

The critique offers an alternate, authentic architecture based on two essential aspects: an understanding of place and tectonics. Significant within the critical regionalist idea are the use of local materials and craftsmanship, and the response to climate and light. This approach promotes a spatial and experiential architectural approach, as found in the phenomenology of place concept, as well as promoting an architectural practice which is more ecologically sound and aesthetically differentiated. (Nesbitt, 1996: 468-467)

The works of Paul Rudolf, Louis Khan, Renzo Piano and Alvar Alto display approaches as defined by the critical regionalist concept. Local architects such as Peter Rich display similar



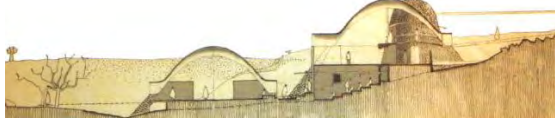


Figure 7 Section: Mpungubwe Interpretation centre, (Digest S.A, 2009: 89)



Figure 8 Plans: Mapungubwe interpretation centre (Digest S.A, 2009: 89)



Figure 9 use of water and light (bradleybowers.tumblr.com)



Figure 10 Tijiboua Cultural Centre (inhabitat.com)

understandings of rootedness to place and the abstraction of local ideas while engaging in universal ideas, as can be seen in the Mapungubwe Interpretation centre pictured in figure 7.

The centre commemorates the site of an ancient civilisation and has a strong relationship with the dramatic landscape. The design, inspired by the landscape and its history, uses stone sourced from the site, to cover the tumbrel vaults which reflect the forces found in nature, allowing the building to blend with the natural terrain. The buildings engage with the landscape, as exterior spaces are defined by the composition of the buildings. The composition is defined by an underlying triangular geometry that echoes ancient stone makings found on site as illustrated in Figure 8. This approach exemplifies a transcendental African space-making. Local craftsmanship, materiality and site approach are significant factors in the composition of the buildings which allow for a rootedness to its natural environment (Fitchett, 2009: 88-89). The building utilises methods of reflection and carefully considered approaches to the uses of light within the building as displayed in Figure 9.

The Tijiboua Cultural Centre by Renzo Piano (Figure 10) is another example displaying a

critical regionalist approach. Here elements of local culture and tradition is utilised as a design generator. The technique of defamiliarization is employed as the local huts structures are re-interpreted using modern day approaches in their creation. Local materials which are used in traditional building were re-interpreted and utilised in the building. Overall the building is an illustration of how both global and local influence may be combined in the creation of architecture that speaks of its time while still speaks to its heritage and place. (Lefaivre, 2003: 83)

### **2.2.5 Architecture, Nature and Constructed Site**

Among the architects praised as a Critical Regionalist by Kenneth Frampton is Japanese architect Tadao Ando. His work however responds primarily to the criteria of creating a dialect between natural environments and the built form while still employing modern construction methods, in a non-standardised way. Cultural aspects of design are seen to have less of an influence on his designs than other critical regionalists. Tadao Ando perceives his method of design as a way forward, pushing past the deteriorating modern and post-modern era and calls for transparent logic which transcends the visual field, to the field of reason (Nesbitt, 1996:458-459). Through this 'critical action' of reason, beauty transcends the surface and geometrical qualities of architecture and permeates the entire architectural work (Nesbitt, 1996: 459). Tadao Ando applies the method of abstraction and contrast in order to give the chosen elements of nature -sky, water, light, wind or history- importance.



Figure 11 Church of Light ([www.greytheblog.com](http://www.greytheblog.com))



Figure 12 Row house, by Tadao Ando (courtyard-house.blogspot.com)



Figure 13 Row house- interior courtyard view (courtyard-house.blogspot.com)

Tadao Ando is renowned for his use of light, and abstraction of natural elements to confront man with the presence of nature via a means of creating tension. Such methods can be seen in the Church of light, Osaka Japan (Figure11). Here the method of abstraction is applied to the element of light, thereby enhancing and drawing ones attention to the element.

In the design of the Row house (Azuma Residence Figure12 -13) Tadao Ando created a simple geometric concrete enclosure attempting to create a micro-organism within it. The house is divided into three sections, with the central portion being a courtyard. This courtyard is used as an element which brings life to the otherwise static enclosure through the elements of light, rain and air.

Tadao Ando states that the use of the courtyard and the movement of human activity within the space, activates and gives life to the simple enclosure, giving importance to these elements of human activity and variation of natural elements as experienced in the courtyard (Nesbitt, 1996: 459). Ando recognises the dynamic quality natural elements imbue the built environment with, stating: *“the elements of nature- water, wind, light and sky- bring architecture derived from ideological thought down to the ground level of reality and awaken man-made life within it”* (cited: Nesbitt, 1996: 460)





Figure 14 Base Valley house ( Hashimoto, 2011: 97)

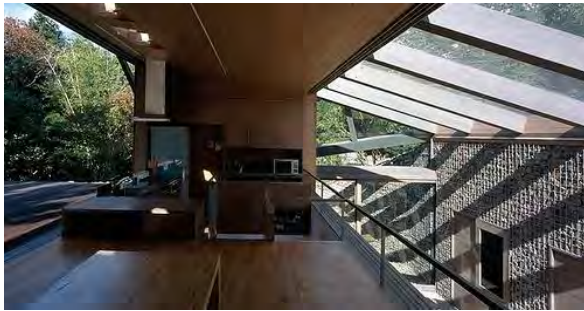


Figure 15 Base valley house- interior (design-milk.com)

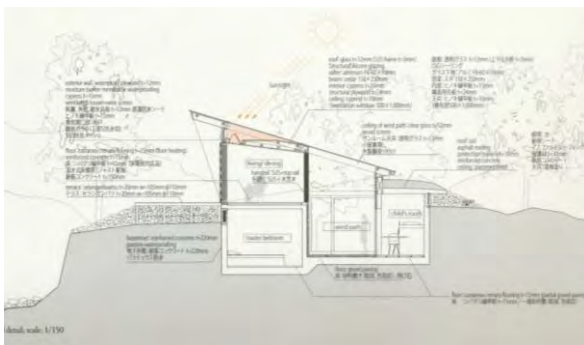


Figure 16 Base valley House: Section ( Hashimoto, 2011: 100)



Figure 17 Plans ( Hashimoto, 2011:100)

Japanese architect Hiroshi Sambuichi, further explores these aspects of the natural environment, in a manner which he calls considering the “details of the earth”.

Through extensive reading and analysis of site, climate and topography, Hiroshi Sambuichi creates architecture which is deeply related to its context. The design aesthetic of his work is one which reads as a natural evolution from the modern movement, moving towards a gentler and more sensitive design approach than the former style. Air and water are regarded as moving materials, which are composed with the non-moving concrete elements of space, such as timber and concrete. (Hashimoto, 2011: 9 )

Materials are selected through the understanding of the properties of materials and how they react in heating, cooling, and their reactions to the moving materials (air and water), to provide an approach to design which transcends the surface experience of space. Hiroshi Sambuichi then derives forms which respond to these intricate understandings of site and natural energy (Hashimoto, 2011:9).

Hiroshi Sambuichi’s Base valley house, displays a deep understanding of the micro climate of the area in which it is situated. Wind and air flow dynamics are primary to the design resolution, which links the

building to its site (Hashimoto, 2011:81). The tent like structure of the house, constructed of glass and wood induce ventilation by using solar heat. Sunken in bedrooms harness the winds and geothermal heat.

Sambuichi likens the role of architecture to that of a tree stating:

*“like a tree with roots and leaves, a work of architecture should achieve balance above ground and underground; it’s form and appearance should be suited to the local climate and its details reflect its various functions”* (Hashimoto, 2011: 178).

It can be gatered that the built form creates its own micro climate so to say, as do elements in the natural world do, such as forests ect. The understanding of the dynamics of the natural world can be utilised and applied in a manner which create spaces that provide experiences of space which are dymanic and life enhancing.

## 2.3 THE CITY AND ITS NATURAL ENVIRONMENTS

### 2.3.1 The City as a natural evolution

According to Norman Crowe (1995: 205), the development of towns and cities can be defined as a natural phenomenon as it is an expression of man's natural cultural evolution. Such formations fulfil man's need for community and sense of belonging. Furthermore, gathering of people in such forums have a great number of advantages, as there is a greater amount of amenities which its inhabitants may enjoy (Cullen, 1983: 7). The primary purpose for the establishment of cities is therefore rooted in communal gain, promoting a sense of community, humanity and development of human relations.

As the city is a place of human habitation, the environment which the city creates can be assessed by its ability to support life. Contemporary cities by contrast are found to be sterile and machine like and do not provide man with his physiological and life sustaining needs (Johnson, 1993: 24). Much of this is due to urban design paradigms which place emphasis on master planning solutions which:

- Segregate functions into zones, restricting complimentary activities from occurring resulting in alienation
  - Create boundaries, limiting connections and networks from place to place
  - Design for machine efficiency rather than sustaining life and its complexities
  - Place control in the hands of a few regarding functionality of spaces through master planning, as opposed to responding to needs as they naturally occur and evolve
  - Cause fragmentation through the preference of cars over human experience of space
  - Favour fast paced developments which do not allow for a process of feedback and response to real needs
  - Cause environmental degradation, resulting in poor environmental quality (air, noise pollution)
  - Lacks *flow*, through overstimulation and
  - Design with an end product in mind, resisting the idea that things change and evolve in time
- (Ellin, 2006)

Such approaches hinder the natural evolution of city developments that intrinsically develop in relation to local circumstances to manifest authentic spaces. There is an art to the creation of urban spaces, just as there is an art to the creation of architecture (Cullen, 1983: 8). It is

the art of relation. Slow sincere process of design, allow for intuitive connections to develop naturally and evolve with a greater degree of flexibility (Ellin, 2006: 1). This allows for changes to suite factors as they arise, shaping the environment on a feedback cycle of improvement. Such approaches take cues from the biological world, as connections, relationships and networks are established, thereby creating dynamic relations and promoting community.

Many theorists often call for *flow* or *life dynamism* as found in the natural world when creating urban spaces (Day, 2004; Ellin, 2006; Cullen, 1983). These concepts refer to spaces which are varying and stimulating. Spaces which achieve flow are characterised by the balance between overstimulation and boredom (Ellin, 2006: 6). Such spaces have a sense of harmony, that is not monotonous nor is it an endless maze. Laurie (1979:7-8) points out that often spatial satisfaction is not due to the large dramatic symbols of man's ingenuity, but through the small provisions of nature which provide sensory delight and humanise the spatial experience (see figure 18).



Figure 18 Glancing up at daylight (Pelletier, 2006:263)

William Whyte (1988) places emphasis of understanding the urban environment in respect to the pedestrian experience (cited: Pelletier, 2006: 261). In his book: *City: Rediscovering the centre*, Whyte outlines the interplay of nature and urban life placing emphasis on the sensory qualities of the natural environment (Pelletier, 2006: 261). Sunlight is amongst the elements given due weight,

as Whyte stresses it as a public right (Pelletier, 2006: 262-263). While zoning falls into the realm of town planning, due consideration should be given to providing frameworks that enhance natural qualities within the urban environment.

The above discussions relate the varying layers which must be considered in the urban environment. The manners in which the varying layers relate provide an environment which either enhances or deteriorates life. It is therefore important to understand the city environment from a holistic point of view.

### 2.3.2 The importance of nature in the urban environment

By the end of this century, the world's population shall move from being a predominantly rural society to an urban civilisation (Girardet, 1992: 11). During this process, the boundaries which separate humanity from the natural environments grow ever stark, as wilderness is confined from man-made urban areas, farmlands are abandoned for suburban living and virtual reality substituted for real experiences (Skakoon, 2008: 37). Lifestyles have changed in a manner which segregates and disconnects us from the physical and biological world, as our world grows increasingly technologically based. In the past, human lives were regulated by the physical and natural environments- the climate, terrain, seasons and length of day- these tangible elements connected man to the natural world giving human life meaning and purpose (Miller, 2006: 1-2). Lifestyles in the post-modern world by contrast, are regulated by manipulating electronic data on screens, sitting indoors for the most part, in complete isolation from the realities of the real world (Miller, 2006: 1-2). Disconnecting from the realities of the world causes great harm to the natural world and humankind, as the society becomes concerned with individual needs rather than that of the greater whole (Mcharg, 1992: 42-43).



Figure 19 New York as seen from space  
([www.universetoday.com](http://www.universetoday.com))

Ian McHarg (1992:43) provides a perspective of cities, whereby one may understand its impact on its greater environmental context, asking one to think of earth in its totality, as if one were viewing earth from out of space. He states:

*“Man in space is enabled to look upon the distant earth, a celestial orb, a revolving sphere. He sees it to be green, from the verdure on the land, algae greening the oceans, a greening celestial fruit. Looking closely at the earth he perceives blotches, black, brown, grey and from these extend dynamic tentacles upon the green*

*epidermis. These blemishes he recognises as the cities and the works of man and he asks ‘Is man but a planetary disease?’” (1992: 43)*



Protagonists of the ecological movement, such as Herbert Girardet (1992: 24), Michael Braungaut and William Dounough (2002: 94-98), further enhance this diseased like metaphor of cities comparing cities to a parasitic organism. Such systems extract precious resources from the hinterlands without returning any value to these lands to maintain this process. This idea of the city as a living organism or ecosystem is explored in urban ecology theories and the Gaia hypothesis. These theories highlight that the earth is a living organism that is interdependent and interconnected at all levels and scales (Ellin, 2006: 13). Current city models present an unbalanced ecosystem as the concentration of people and human activities create an energy intensive ecosystem (Collins *et al*, 2002: 416). However from an energy consumption point of view it is necessary to acknowledge that the city model is a step toward a more energy efficient future. This is due to the dramatic reduction of energy used per capita as compared to other models of living (Owen, 2009: 2-3). The alternative to the city is one which results in sprawl. This would see a great expansive network of low rise developments accommodating the same number of people and in the process increasing travel distances, energy use, exposed surfaces, and eradication of larger areas of wildlife and ecosystems. Most of all, it shall create a greater fossil fuel foot print (Owen, 2009: 1-6). Therefore while the city poses sustainable problems, so too does it offer solutions.

Within architectural debates it is often found that there is a tendency to advocate one system over another, in this case, high-rise city developments over low rise developments. While there are problems with the low rise model in terms of energy use, its advantages should be acknowledged. The rise in suburban developments indicates that such developments offer its inhabitants something of value which cannot be found within the city. Some of these advantages are the human scale, greater access to green spaces and areas for children to play safely. Urban theories such as integral urbanism recognises the value of both systems and propose that a mix of scales be utilised within the city environment so as to satisfy the varying needs of its diverse community (Ellin, 2006: 22-23).

Richard Louve (2005) places grave concern over the snowballing effect the disconnection with the natural environment may have on society, highlighting the present state of awareness of our ecological heritage within children, a state he describes as 'nature deficit disorder'. There is genuine concern that the emerging technologically attached generation will lack the passion and care for the environment, thereby losing out on a world which is inspired through

the wonders of the natural world. Disconnection from the natural environment shall also lead to an increase in the rate of stress related illness, autism, ADHD, respiratory diseases and other child related illnesses (Beathly, 2011: 4). Laurie (1979: 8-10) calls for design interventions which educate and create awareness within society on the value of the natural world, thereby creating a society more sensitive to the natural world.

Natural elements -such as general greenery, water features, natural topographical features are often second thoughts when it comes to urban planning, opting to confine green areas to certain parts of the city, and eradicate any traces of the natural terrain. This approach however has devastating effects on the wellbeing of the inhabitants (Mcharg, 1992: 187-195). Extensive studies done by Ian Mcharg (1992: 187-195) show that the; physical, social and mental wellbeing of the inhabitants of the city is directly related to their physical environments. Those areas with greater amount of pollution, noise and lack of integrated natural environments have greater risks of falling victim to these ills. Humans are complex creatures who require spaces that inspire, invigorate, comfort, relax, and reassure, rather than spaces which allow only for the limited functional aspects of living (Almusaed, 2011: 4). Nature within cities provides city spaces with these dynamic qualities which promote health and help in the reduction of the city ills. Jane Jacobs (1961: 91-111) however points out that there are social and human behavioural tendencies which one needs to keep in mind in the creation of spaces such as parks etc., as these spaces may in fact attract gangs and the homeless if there is a lack of surveillance and human activity within these spaces, therefore incorporating of open areas within the urban environment needs to be considered in conjunction with human tendencies.

It is a widely recognised fact that nature plays an important part in providing us with healthy environments, from the air we breathe, to the de-stressing qualities it brings to our lives. An integrated response to our natural environments is therefore essential and not optional as is often perceived (Beathly, 2011: 3).

### **2.3.3 Integrating natural and man-made urban environments**

The understanding that nature is integral in city developments is one which has long been explored. Urban theories such as the Garden city movement, New Urbanism and Urban Villages recognise the importance of the integration of natural environments within the city for the promotion of good health. Among the theorists who undertook the task of providing

an alternative to city spaces which finds a balance with nature was Ebenezer Howard's (1898) Garden City movement.

Howard (1898: 44-49) envisioned cities which were moderately sized, self-contained systems. The main purposes for such developments were to enable people to live healthier lifestyles and were in response to the slums and dirt found in the city during the industrial revolution. Howard recognised that the city is a magnet which provides for social opportunity, while the country provides a magnet due to its beauty and abundance in nature. Recognising the benefits of both, he thereby proposed a third alternative solution, this being the Garden city which marries the benefit of both city and country. (Howard, 1898: 44-49)

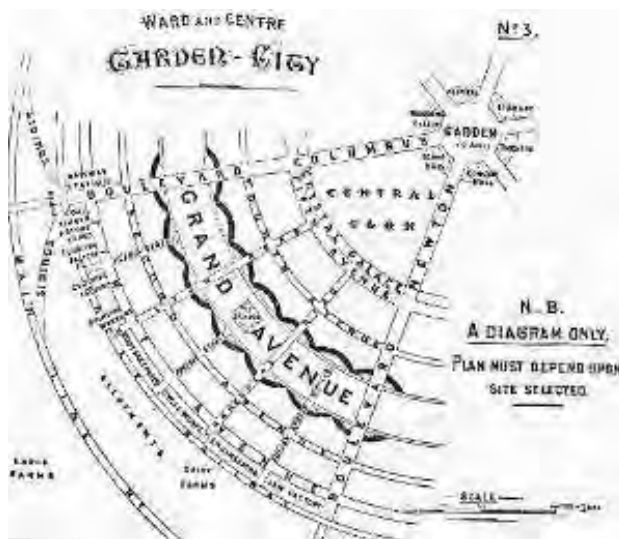


Figure 20 Conceptual master plan of the garden city movement (Howard, 1898:53)

The layout of the garden city was centralised around a park, with bands of buildings forming rings around the central garden, with the most public buildings located nearer the centre fading out into more private allotments on the outer rings and enclosed by means of a green belt. The belt consisted of farm lands which provided the city with food and supplies and restricted further growth of the city (Howard, 1898: 44-53). However, the implementation of this conceptual framework differed greatly in reality and

has often been criticised for its utopian point of view. The scheme, which was envisioned as layout transplanted onto virgin sites, left little room for diversity, thereby manifesting an imposing and arbitrary character. Ian McHarg (1992) highlights the movement's denial of the understanding of the natural environments processes, opportunities and constraints provided. The scheme however can be commended for implementing strategies which are conceptually based on the creation of community and enjoyment of nature.

Seeing as the social and environmental aspects of cities are closely intertwined, urbanist Peter Caltrope (1993), like Ian Mcharg (1992) suggests that physical and political topographies be conceived as one integrated system:

*“At the regional scale, the man-made environment should fit into and along larger natural systems. Urban limit lines or growth boundaries should be set to preserve major natural resources at the edge of the metropolis... within this regional boundary, major natural features and streams should form an internal structure of park like linkages, trails and cycleways throughout the metropolis. Such open space elements should link and limit individual communities. In these areas the natural system should be preserved and repaired.”* (Caltrope: 1993, cited: Hagan, 2001:183)

Such integrated approaches, according to Susanah Hagan (2001:183), could be read as an attempt to return to traditional ways of establishing identity in accordance to the physical characteristics of place. In this way natural elements of the topography are used to set limits and boundaries which are seemingly natural, as opposed subjective man-made physical boundaries and political constraints. In this manner human settlements co-inhabit rather than impose and colonise, thereby blending the natural environment with physical man-made elements. Such approaches promote local identity and authenticity inspired by natural conditions.

It is found that within emerging urban theories of biophilia, integrated urbanism and New urbanism, great emphasis is placed on humanising spaces, which go hand in hand with a conscious awareness and close communion with nature. These methods aims to overcome challenges of physical and social degradation of cities, emphasising minimal environmental impacts, higher quality of outdoor life and the creation of spaces which encourage, inspire and uplift the human spirit (Kats, 1994; Beathly, 2011; Ellin, 2006). Lurie (1979: 8) suggests that humanised landscapes with a sense of connection to the natural environments may be achieved if three fundamental principles are applied, these being:

1. Respect for environmental limitations and advantages, including the subtle variations in topography and microclimate
2. The creation of diverse habitats and hence the co-existence with diverse organisms
3. The achievement of a dynamic balance of forces (wind, heat, light, air)

Contemporary built environments rarely show such co-existence with the natural environment, opting to create a man-made world catering primarily for the functional and efficient aspects of design. Current relationships with the natural environment often see a face to face, or edge to edge relationship with natural environments (Almusaed, 2011:41), as

illustrated in Figure 21. Parks confined within cities areas often display this type of relationship. Such relationships with nature display current attitudes, whereby man is set apart from nature.



Figure 21 Face to face- edge to edge relationship (Almusaed, 2011:41)

Inter-related relationships as displayed in Figure 22 , illustrate the city environment and the natural environment conceived as one and the same entity. This integrated paradigm is encouraged in biophilic city concepts, urban ecologists and by the new urbanism principles. There is a growing recognition that man is part of and not isolated from the functioning of the ecosphere and that there is an essential interdependence, a two-way link between man and nature (Tregay, 1979: 268). In this manner cities begin to respond to intrinsic human needs while displaying a respect for the natural environment.



Figure 22 Integrated city and natural environment model (Almusaed, 2011:42)

Trends in cities around the world are looking towards similar types of integration with the natural world as there is an emphasis being placed on ecological rehabilitation of previously rich ecosystems. Such efforts can be seen Portland, Oregon, where the city aims towards creating spaces which encourage outdoor activities and exploration of natural habitats which are interwoven with the city fabric. Through this approach, spaces encourage rich, textured,

multisensory experiences which celebrate unique biodiversity's, encouraging engagement with and awareness of nature. Beathly (2011: 137) emphasis the promotion of outdoor activities, which encourages an overall connection to the local context, climate and geography, bringing ones awareness to place and time.



Figure 23 Out-door activities- water sports Portland (www.urbangreenspaces.org)



Figure 24 Out-door activities-Bird watching, Portland (www.urbangreenspaces.org)

Various principles have been found to be suggested by numerous authors which assist in creating an integrated paradigm. Outlined below are a few which have been emphasised:

*Co-habitation:* and respect for natural habitats, wild life and natural features. Placing emphasis on the understanding that man and nature are part of an inter-related system as the Gaia hypothesis states (Beathly, 2011; Lvarie, 1979)

*Accessibility:* Promoting spaces which allow for human interaction with natural features, and easy access to diverse habitats

*Diversity and variety:* encouraging and celebrating natural cycles and local biodiversity.

*Restoration:* of previously damaged ecological habitats (Beathly, 2011: 10, 46, 73,154.)

*Edge complexity:* allowing natural formation of edges between rivers and banks etc. where possible, as it is better suited to natural forces and provides diverse habitats for various micro-organisms (Lvarie, 1979). Nan Ellin (2006: 82) suggests similar methods may be applied to human activities which converge, as these spaces create rich activity both in the ecological and human world.

*Continuation and Flow of ecological habitats:* allowing natural linkages of various habitats and limiting of fragmentation of sensitive habitats, especially near water sources. Similarly a flow of human activities and linkages in relation to pedestrian experience, thereby intertwining human and natural spaces (Lvarie, 1979; Ellin, 2006; Beathly, 2011)

*Design with nature:* with context and topographical features, understanding the processes of nature and complimenting it rather than imposing and colonising (Mcharg, 1992)

*Balance-* between Civic and natural needs (Luarie, 1979: 6-8)

*Symbolic natural elements-* spaces which evoke magical qualities of nature where actual natural elements cannot be utilised (Luarie, 1979: 32)

*Awareness and education:* the provision of spaces and institutions which create awareness and set out biodiversity action plans (Beathly, 2011; Luarie, 1979)

*Outdoor/ biophilic activities:* walking trails, bird watching, canoeing, active participation with nature etc. (Beathly, 2011: 62)

*Connectivity and hybridity:* allowing for the establishment of human relationships, through the creating of connections and networks, rather than isolations encouraging symbiotic relationship between nature and people (Ellin, 2006:18-19)

The above points illustrate that integrated urban paradigms do not seek to remove civic order; rather it is an adjustment of priorities in search for a more balanced habitat of which man is a part of. Such paradigms seek to enhance the life sustaining qualities of an environment for the benefit of both man and the natural world.

### 2.3.4 Benefits of an integrated paradigm

Susannah Hagan (2001: 190) underlines the mutual benefits of integrating social and environmental systems, highlighting the point that such integration can benefit the ecological and technological systems of the city. Current City models mainly present linear metabolic systems, as pointed out by Herbert Girardet (1992: 24), using resources and producing end



Figure 25 Linear vs. circular metabolic systems (Girardet, 1992:24)

products resulting in waste. Furthermore Mc Dounough, W & Braungaut, M, (2002: 98-99) demonstrate that the ways of current technological and biological processes are often merged into one hybrid system which render the end waste products unusable and harmful to the biological world.

Cities which work in a holistic manner can produce circular systems which are

ecologically and technologically sustainable (see figure 25). If closed loop systems, one which deals with biodegradable materials and the other with technological, are created and encouraged, there will be a greater reduction in waste materials and less reliance on extraction of new raw-materials. Moreover, by-products of one system may be utilised in other systems relieving the reliance on energy (Mc Dounough, W & Braungaut, M, 2002: 103-115). These concepts provide systems which aid in improving the metabolic systems of the city and reduce its heavy reliance of resources from the hinterlands.

The main benefits associated with an integrated approach lies with the quality of environmental conditions that may not necessarily be seen, but is qualitatively felt. Seeing as such methods encourage the creation of human habitats which sustain both biological and human life, the quality of the environment improves through the subtle but felt forces of nature (Luarie, 1979:30-31). The increase of greenery and other natural elements counterbalance the harsh effects technological and manmade elements of the city. Some of the benefits being:

*Reduced noise pollution:* according to Almusaed (2011: 151) studies have shown vegetation to act as good sound insulators, absorbing or deflecting sound rather than the amplifying effect it has on the cities hard man-made edges. Christopher Day (2002: 52, 61) further underlines the soothing sounds which the ruffling of tree leaves and moving water bodies' produce. Such elements help soften harsh city sounds.

*Counteracting Urban heat island:*

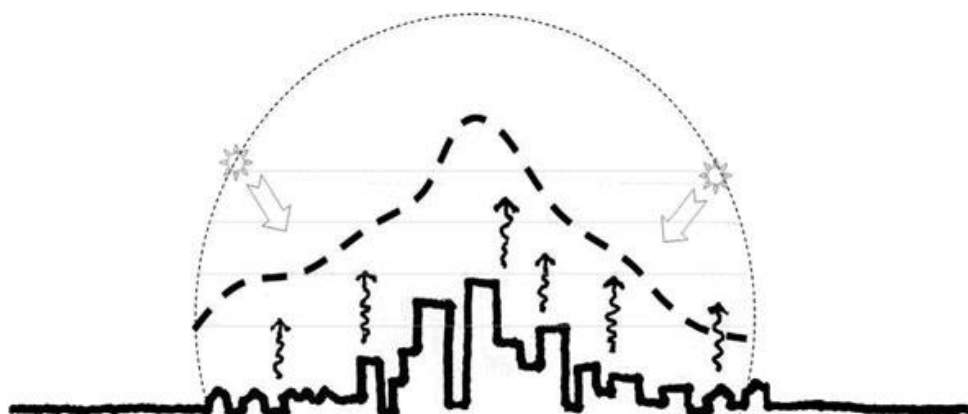


Figure 26 Urban heat island phenomenon (Almusaed, 2011: 140)



The phenomenon heats up the city environment several degrees warmer than that of its surrounding country. Studies have found that this phenomenon has the ability to influence climatic patterns within the city (Collins *et al*, 2002: 416). The creation of such a phenomenon is due to three main factors:

- heat storage from stone, asphalt, and concrete surfaces
- heating due to combustion and energy usage from cars, factories, heating and transport systems
- heating due to production of gases such as carbon dioxide and nitrogen oxide, which act as green house gases which build up around the city (Almusaed, 2011: 140-141).

The main contributing factor to urban heat is the city texture. Textures which is dry, has no elements of water or vegetation further heighten the impact of the heat gain in cities. Vegetation and water, according to studies done by NASA, effectively reduce heat gain, as plant life cools the air through expiration (Almusaed, 2011: 140). Where there is a lack of vegetation, such as in countries found in the Middle East, light coloured surfaces may be used as a strategy to effectively reduce heat gain through reflection (Almusaed, 2011: 140). While urban heat island may deceptively appear to be a small problem, its resultant impact on urban human life is great as highlighted by Almusaed (2011: 142-146). Some of these impacts include: increase energy consumption due to larger reliance on mechanical cooling, amplified air pollution, increase health risks especially respiratory difficulties, impaired water quality affecting water ecosystems and an increase in thermal discomfort (Girardet, 1992; Almusaed, 2011).

The phenomenon of urban heat island illustrates to us the ability of the built form to create micro-climates. While the above discussions have illustrated the negatives of urban heat island there are lessons which may be extracted. The main lesson to be extracted is the understandings of the collective power of materials and its ability to produce micro-climates. This understanding can be utilised so as to produce environments which are life enhancing and suitable for human habitation. Buildings in hot arid areas may utilise reflective colours and canyon like spaces to provide human comfort, while cold areas may utilise materials and colours which retain heat. While the phenomenon of urban heat island is detrimental in one context, it may not be so in another. Therefore it must be emphasised that every relation is relevant to its context.

*Air Quality:* air, more specifically oxygen is essential for human survival. Natural processes of photosynthesis, which is arguably the most important process on earth, produce this vital gas, oxygen ([bioenergy.asu.edu/photosyn/study.html](http://bioenergy.asu.edu/photosyn/study.html)).

City environments which lack vegetation have a decreased quality of air, as the city processes as well as humans expel carbon dioxide, resulting in increased health problems. Figure 27 demonstrates the average requirement of plants needed to provide such air quality. It stands to reason then, that with the increased amounts of

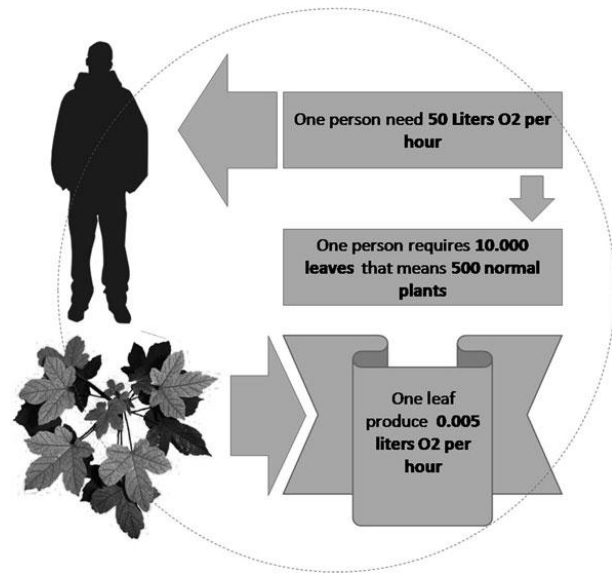


Figure 27 Average plant requirement for the production of oxygen for 1 person (Almusaed, 2011: 160)

people and other emissions in urban areas, an increase in vegetation is needed to offset these gases and provide healthier air. Biophilic architecture suggests that both vertical and horizontal greening devices should be implemented to facilitate in providing spaces rich in oxygen (Beathly, 2011: 7). Yaeng (2006) points out that while man may build artificial processes which replicate the process of photosynthesis, it will not be as beautiful to walk through. Furthermore natural elements such as plants and water help in filtering dust and other pollutants found in air (Day, 2004: 51).

*Socio and human psychology benefits:* due to the increase in brain stimulation in concentrated areas, cities are known to have an increase in stress level and an increase of mental health and anxiety problems (Day, 2004: 59, 78). According to Almusaed (2011: 177-179) simply viewing an attractive landscape and the colour green in general helps in the reduction of stress. Furthermore, elements such as wind, rain, water are found to be calming and relaxing. Christopher Day (2004: 2-4) declares that there is a relative correlation between crime and the spaces in which they occur. Humans respond to environmental stimuli although we have the ability to transcend the situation, environmental factors imperceptibly influence us without any conscious resistance from us (Day, 2004: 3). Therefore spaces which incorporate elements which stimulate calm and peace, as found in natural environments are less harsh to our senses and promote socially healthy spaces for which people may interact in a positive manner.

## 2.4 THE NATURAL ENVIRONMENT AND ARCHITECTURAL DESIGN

The hypothesis proclaimed by E.O Wilson's (1984) biophilia theory declares that man has an intense need to belong to the rest of the living world. This concept when applied to architecture and the built form, promotes an integrated approach between the natural environment and the man-made. Primary to the concept of biophilia is the creation of healthy spaces in which to live in and the intimate merging of man-made structure with natural structures. Such an approach involves bring natural elements into the building encouraging natural light and incorporation of plant life (Kellert, Heerwagen, Mador, 2008: 2-5). It is supposed that the natural environments keep us healthy and promotes physical performance, an integrated response is therefore essential (Almusaed, 2011: 3). These environments are achieved through the sensitive understanding of the natural environment, engaging with it, utilising it for man's benefit while avoiding damage to the environment (Beathly, 2011: 15). Concepts such as building biology movement are found to be similar in theory. Building biology conceives buildings as being a breathing-living organism, whereby the building enclosure acts as the 'third skin' of the human body, the first being, human skin, the second-clothing and the third the building (Vassela, 1992-3: 7). Primary to this movement is the use of materials which aid in the creation of healthy spaces.

Aspects which promote physical wellbeing are the variation and stimulation of the senses. The flatness of today's standard construction techniques as pointed out by Juhani Pallasmaa (2005: 15-16), does not engage with us with senses other than sight, in what he calls an occularcentric world. The notion that our experience of space is one which is multisensory has been explored throughout architectural history, although its importance was negated during the modernist period of architecture. Authors such as Peter Zumthor, Steven Holl, Juhani Pallasmaa, Christopher Day and Victor Papneck, have placed great importance on the multi-sensory dimension of space and its effect on man's experience of the space. This multisensory dimension of space is easily recognisable in natural environments, and is found to elude the current man-made environments. The aspects which imbue architectural spaces with life enhancing qualities shall be explored in this section.

### **2.4.1 Symbolic expressions of nature and dialectic connections to the environment through the art of architecture**

The early works of man reflected a connection to the natural world and were symbols of hope and education regarding the cycles and resources of the earth, which assured the well-being

of people (Oakes, 1995: 1-2). Life-sustaining relationships between the earth, sun, moon and stars were revered and celebrated. Presently we find ourselves in a world far removed from our place in the natural order of the world, as technology and humanity are viewed as separate entities from the natural world and other life forms (Berry, 1995: 9-10). Phenomenon of the earth and the celestial cycles previously provided man with inspiration and was reflected in myths, music, dance, art and architecture connecting man to the natural world. Presently however, through man's objective and scientific shift in thinking, these phenomenon's are reserved for the scientific few, further isolating man from the natural world (Berry, 1995:10).

There have been emerging movements, in the world art and architecture and other associated fields which have recognised that man is connected to the cosmic happenings, and that the world is an integrated whole rather than disassociated part, a holistic paradigm so to say. Berry (1995:10) suggests that man has disengaged from interactions with the natural world which is inherent in our very nature causing man to become autistic in relation to the natural world. It is suggested that dialectic relationship with nature and its phenomenon through art and architecture may consciously bring awareness to the simple beauty of the natural environment. Illustrated below are examples of structures which create such dialogue.



Figure 28 Gestation: sunset, winter solstice (Oakes,1995: 39)



Figure 29 Giant equatorial sundial, Jaipur (Oakes,1995:21)

Gestation sculptures by Baile Oakes (Figure 28) and the giant equatorial sundial (Figure 29) are example of art which fosters understanding of phenomenon of the natural world, in this instance, the cycle of the sun (Oakes, 1995:21-39).

Colour, movement and variety of living things are aspects in nature which provide man with constant delight; however the inclusion of literal organic life in nature may not always be

possible due to constraints such as climate or priority of facilitating man's functional needs. These connections can be expressed symbolically rather, in a manner which invokes similar experiences as found in the natural world. Eckbo (1969, cited: Laurie, 1979) expresses man's yearning for connections through symbolic expression stating:

*“ever since man acquired sufficient control over his environment... he yearned to surround his buildings with spatial compositions constructed of earth, rock, vegetation and water, representing the worlds of nature and of man in co-existence”* (Eckbo, 1969 cited: Laurie, 1979: 31)

Similarly Ian McHarg (1969, cited: Laurie, 1979) describes the powerful qualities symbolic design may achieve for a man escaping the heat and glare of the city street:

*“we stood on a narrow terrace beside the pool, savouring the silence, then discovering below it small noises of the trickling fountain, drips and splashes, the rustle of the delicate aralia leaves, seeing the reticulated patterns in the pool, the dappled light. Here were these self-same precious things, but consciously selected and arrayed, sun and shade, trees and water, the small sounds under the silence. What enormous power exerted by these few elements in this tiny space”* (cited Laurie, 1979: 32)

The above statements demonstrate that the connection to the natural world may not always be due to physical interactions with literal natural landscapes or organic life. Rather it is spaces that evokes and reminds man of qualities of spaces as found in the natural world which appeals to the human experience. It can be expressed in the pools of daylight, the echoes and splashes of water in fountains, the play of light, change in levels or the sounds of trees swaying in the wind (Luarie, 1979: 32). The orchestration, play and dramatization of these elements create environments which connect man to the natural world in its diversity and variety and the qualitative holistic experience of space in relation to man.

#### **2.4.2 Boundaries, separations and connection**

Man's experience of buildings is an experience engaged with a boundary membrane which separates inside and outside (Day, 2002: 10-116) and rarely ever experienced as an object in space. Thus the manner in the boundary is designed is essential for the creation of architecture which engages our experience of space. Conversational qualities, as Christopher

Day (2004: 84) and Werner Blaser (2002: 7-8) point out, is essential for the foundation of a harmonious integration between man-made and the natural environment.

The emphasis on form and image widespread in contemporary architectural practices has been widely criticised for its denial of the experiential qualities and climatic considerations of architectural space, often alienating the user and isolating the natural environment from the man-made architectural elements (Day, 2004; Pallasmaa, 2005; Zumthor, 1999). Juhani Pallasmaa indicates that the resolution of the formal structure of a building does not necessarily mean a resolution of artistic quality or effect on human experience (cited: Nesbitt, 1996: 448).

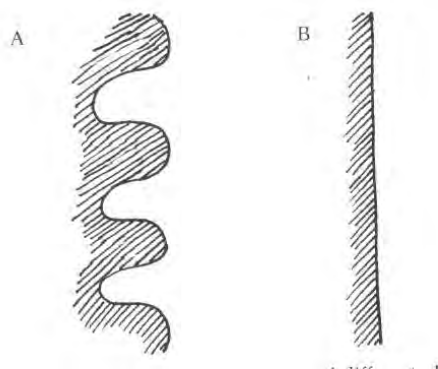


Figure 30 Line dynamics (Day,2002:30)

Designs of buildings which engage between the boundaries of inside and outside are found to have qualities of life and movement, and bring a life influence to the building bounds. Elements of line, form and shape when carefully considered and sculpted can project qualities that convey movement, life, harmony, gesture and resolution of dynamic forces (Day, 2004:10). In this manner the building and its immediate environment engage in an integrated dialect. Figure 30 illustrates the use of dynamic lines to engage or separate the inside/outside boundaries. Figure A demonstrates a larger surface area for which integration between the two spheres may inter-act displaying similar organic qualities found when two contrasting boundaries in the natural environment meet (sea and land- earth and sky etc.). Figure B on the other hand illustrates a static boundary which segregates the two realms. Boundaries may be conceived at the threshold of country and region, region and city as well as building and its immediate context (Day,2002: 30). According to Christopher Day (2004: 14), buildings should be conceived in a similar manner, as spatial boundaries as opposed to objects, as space is to live in while objects are frozen thoughts, the one life enhancing the other dominating. In this manner the spirit of place can develop because of, not in spite of the building (Day, 2004:10).

The boundaries which the building interacts with can be categorised into three, these being:

1. Between earth and building,

2. inside and outside (walling membranes/skin of the building) &
3. roof and sky

*Relationships with the ground:*

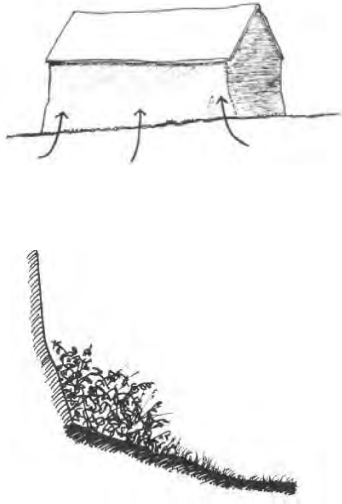


Figure 31 Ground building relationships- rootedness (Day, 2002:34)

The relationship between a building and its topography, displays the attitude which either conflicts or converses with the landscape. Such relationship of building to ground is reflective of the fundamental approach to nature, context and displays how daily life and human activities blend itself with the exterior environment (Eyuce, 2007: 10). Objects as found in nature, trees, rocks etc., display a certain rootedness and belonging. This notion of rooting to the earth is one which is explored by many architects, especially those with a critical regionalist approach as buildings as seen to utilise the site topography (Frampton, 1983: 26-27). It is used as a means to create place qualities within a space, as the boundary of the earth converses with the building as it rises from the ground (Day, 2002: 33). Often however, buildings are found to firmly

attach itself to the ground, for the practical purpose of load transference and stability and do not display a sense of rootedness or conversation with its context (Eyuce, 2007: 10). These buildings are those which alter the natural topography drastically and display a quality of parking on site as opposed to growing as illustrated in Figure 32.



Figure 32 Site, building relationship – Parking on site vs. blending with topography (Day, 2002:35)





Figure 33 Storer house (Weintraub, 2006: 46)

Frank Lloyd Wright, one of the first “organic” architects, displays a poetic conversational quality’s between site and his buildings. While Wrights building display a strong sense of rootedness and grounding to its context, it manages to remain strongly contemporary. In Wrights Storer house, illustrated in Figure 33, the boundary between site and building is blurred by

means of materiality, using the same blocks for the landscaping walls and terraces as well as the building itself (Weintraub, 2006:47). The house’s façade rises up from the ground in a mountain like manner, giving it a felt sense of belonging and rootedness.



Figure 34 Traditional Malay House (plantseed.com)



Figure 35 House by Glenn Murcutt (residentialarchitect.com)

Contrasting the approach of rooting the buildings to its context is an approach which instead meets the ground in light manner (figure-34-35). This approach is often referred to as “to touch the ground lightly”, a philosophy coined and advocated by Australian architect Glenn Murcutt (Shraiky *et al*, 2012: 133-134). This approach displays sensitivity to the earth’s surface as the technique seeks to disturb nature as least as is possible. Similar methods of construction can be found in South East Asia, where homes are elevated from the ground on stilts (Eyuce, 2007: 11-12). Reasons for this type of approach in these contexts are environmentally based as the raised buildings provide protection from floods, wild animals and reptiles and provisions for ventilation as a coping mechanism for extreme humidity of the



hot- humid tropical region. These methods of construction have with them culturally based meanings as well, as Malay tradition dictates sensitivity to nature and therefore buildings should not touch the ground (Eyuca, 2007: 11-12). This interconnection between responding to natural factors and cultural meaning refers back to creation of place as previously discussed (see 2.2).

*Building skin- as a connector of inside and outside:*

The relationship between the inside and outside of a building is one which is a complex phenomenon as it involves both connections and separations to the exterior environment. Often this membrane has to deal with the provisions of complex requirements both functional and psychological (Eyuca, 2007: 16).

The skin of the building can be likened to the face of the building as the first experience of the building is this membrane, therefore this membrane needs to communicate its function so as to allow one to read and identify its purpose (e.g. church, or hospital etc.). While this communication of functionality is an important aspect of design it should not be limited solely for this purpose of representation but rather should also move into the realm of facilitating connections- between inside and outside space (Bixby,2009: 1). Often, it is found that facilitation of human activities and experience of interior space is given preference over the experience and activities which the exterior membrane may facilitate. Architecture is what emerges around and between what is built and not simply within the building enclosure (Bixby, 2009: 7-8) and as such the membrane of the building can be considered a connector and not merely a separator of space. It is important to keep in mind, that when creating spaces internally, spaces outside are simultaneously created.

The skin of a building comprises of two essential components, these being solids and voids. The manner in which these components are articulated is important, as our experience of spaces are articulated and moulded through these planes (Eyuca, 2007: 16-17). We move through these surfaces by voids, and through this movement we experience both sides of this surface, inside, in-between (threshold) and outside. According to Dana Bixby (2009:7-8 ) when the built form is conceived merely on portraying the function and use of the building, the knowledge of space comes not from the experience of space, but the appearance. Thus the enclosure of the building, the separator and connector between inside and outside spaces, in

response to climatic considerations, functionality and human experience are to be carefully considered in the articulation of these planes

### *Roof and sky*

In the similar manner which connections are achieved between the inside and outside through the skin of the building, the roof may provide connections to the external environment. Primarily, the roof is part of the building which is the interface between sky and the indoors and offers internal spaces protection from climatic conditions, and provides protection and solitude through its enclosing form (Eyuce, 2007:18).

Articulation of the roof form may also provide connections with the celestial world, the sky. In buildings found in countries which lack lush vegetation as found in Middle Eastern countries, the failing of rain is celebrated and the sky is a symbol of hope and heaven. Buildings thereby reflect this important connection to the sky through the introduction of a courtyard, and a centrally located fountain which reflects the image of the sky on its surface (Fathy, 1973). Such design approaches are ecologically responsive aiding in providing cooler spaces and relief from the harsh landscape these countries co-exist with. The roof articulation may therefore have connections which are culturally and ecologically meaningful.

Overall it has been established that the planes on a building when conceived as connectors, establish a dialectic relationship with the environment in relation to ecological concerns and human relations. Dana Bixby (2009) sums up this notion stating:

*“For the making of architecture, when we come to know that the surface of a building is a connector, then our effort to design and articulate that connector can be about how to make a better connection. One way that a better connection can be made is with articulation and design of the opening, edges or other parts of the surface that are themselves connectors...”*  
(Bixby, 2009: 8)

### **2.4.3 Materiality**

Architecture reduced to its bare minimum lies with its materiality, it is the starting of form and of construction of space. Most importantly the materials provide the barrier which separates internal and external environments. Peter Zumthor (1999: 10-11) highlights the importance of materiality as he places great emphasis on the concrete aspects of architectural

space, its materials- wood, stone clay, fabric, steel glass etc. These elements and their combinations make architecture “concrete”. It is through the application of these materials that the character of space manifests. Materials, as the basic components of architectural matter plays an important role in addressing both forces of the natural environment and man’s existential needs of expression, solitude and shelter. Thus the type of materials and the application thereof is vital in either connecting or disconnecting these two realms.

Materiality, when thought of in basic functional terms, quantifying and detaching it through reductive modes of objectivity suppresses, the sensuous quality and engagement of the materiality of space (Buchanan, 2008: 53). This method of understanding materiality can be likened to the utilitarian style of architecture, based purely on functionality (Buchanan, 2008: 53). Materials convey a sense of tactility which either encourages sensual engagement or exudes a cold disengagement with its context and excludes the user.

The aspects of materiality in connecting or disengaging with the natural environment shall be discussed using two main precedents: le Corbusier’s Villa Savoye (Figure 36) and Alvar Aalto’s summerhouse on Muuratsalo (Figure 37).



Figure 36 Villa Savoye ([www.galinsky.com](http://www.galinsky.com))



Figure 37 Summer House Muuratsalo  
([www.libertaddigital.com](http://www.libertaddigital.com))

Peter Buchanan (2008: 54-55) underlines the architectural expression endorsed by the modern movement and that of the art deco period as being one which made reference to things which hover, on water or air, machines- aloof from nature. This concept displayed buildings as self-contained objects expressing selfish relationships with its context. Often the true nature of materials was suppressed in order to promote an aesthetic which contrasted its

surroundings, opposing time and the natural laws of aging (Buchanan, 2008: 54). Seeing as the conceptual idea of houses the modern movement was a “machine for living”, the use of materials displayed these sentiments in providing materiality which was lifeless and attempted to defy time. The painted surfaces used lacked a sense of life, neither aging nor weathering, merely cracking or deteriorating as it was easily soiled (Buchanan, 2008: 55).

Pallasmaa (2005: 31-33) emphasises that grasping the concept of time is an essential mental human need, as it roots man to the continuity of time. Architecture is one of the primary instruments that facilitates in relating to us space and time, giving it human measure. Through the process of architecture man allows himself to domesticate limitless space, similarly, he should be able to able to domesticate limitless time and enable himself to inhabit within the continuum of time (Pallasmaa, 2005: 32). Materiality of buildings can be used as the means to ground architecture to time, allowing materials to weather, for its wear to show its history and in this way root itself to the natural inevitable sense of time. Through this method of succumbing to time, human existence is allowed to experience both structures which have come before them and those which aspire to the future, allowing man to partake in something larger than himself and his lifespan (Day, 2004: 16).

Alvar Altos use of rich use of materials in the summerhouse in Muuratsalo contrasts the uniformity of materials used in Villa Savoye. Materials such as red brick and tiles are extensively uses to create textures and patterns which invite the eye to “touch” its surfaces. Such materials invite the user to engage with the boundary separating the man-made environment and the natural external environment. These materials weather well, allowing the external face of the building to blend with its external environment without becoming aesthetically displeasing. The textural quality of the materials further allows the natural elements of nature to add character to the building. Here, there is conversation with the environment as opposed to the isolation found with the modern movements ideals.

Critical to the aspect of materiality is texture and the scale of materials. Contemporary architecture often uses materials which are factory made and are large in proportions, as opposed to materials which are placed on site by hand. Thus the variation of scale of material has varying degree of textuality. Alvar Alto’s use of tiles and brick which are construction methods reliant of hand techniques of placing, creates textures, patterns and rhythms adding richness to the built form.



Figure 38 Ancient Pueblo adobe, displaying plasticity (Papanek, 1995: 124)

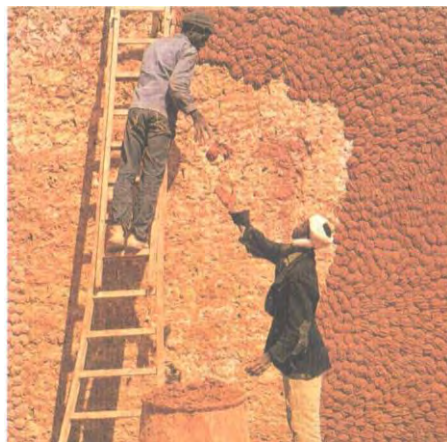


Figure 39 Wall finish-Sahara- Algeria (Papanek, 1995:120)

The loss of plasticity can be seen from the transition from hand-made (Figure 38 & Figure 39) construction techniques to machine made. This transition brought on by the dominant occularcentric control, of western culture in particular, weakened the haptic realm of experience of space and in this way isolates the user from space (Pallasmaa, 2005: 32). Ironically these plastic ideas are finding their way back into the realm of architecture, with the aid of computer aided design, plastic forms and shapes are now moulded to create more fluid architectural aesthetics. The scale of these fluid movements however, are often designed to create forms experienced as an object within a landscape than the more primitive haptic structures which related directly through the experience of the space and its human relation. The materials employed by these past plastic creations suggested the gravity of the building and the tectonics of how it was made, adding a sense of honesty to the built form (Papanek, 1995: 124). Contemporary materials by contrast

separate structure and appearance. Such methods hide the true gravity of the building and the truth of the structure is hidden.

Natural materials such as stone, wood and clay- living materials often add a sense of life or living to a building. They appeal to our haptic senses, the rough edges of a stone asks us to keep away, the smoothness of finished wood, its scent, breathing, living- plastics and steels on the other hand have a cold composition (Zumthor, 1999: 58). Frank Lloyd wright, acclaimed for his use of materials and grounding architecture can be seen using natural materials and displaying the tectonic properties of the material, as employed in Taliesin West (Figure 40).

Juhani Pallasmaa (2005: 31-32) suggests that the flatness standard construction techniques are strengthened by the weakened sense of materiality. Natural materials allow for vision to





Figure 40 Taliesin West (www. archdaily.com)

penetrate the surface and enable us to be convinced of the authenticity of matter. Natural materials express their age and history, as well as the story of their origins and their history. All matter exists in the continuum of time; the patina of wear adds the enriching experience of time to the materials of construction (Weston, 2008: 116-117).

Concepts within place theory such as phenomenology and critical regionalism place great emphasis on the use of local materials for the creation of architecture which evokes a sense of place (Norberg Schulz, 1980; Nesbitt, 1996). Through the use of local materials, local methods of construction is encouraged allowing for the creation of architecture which is place specific while endorsing the creative genius of the people their traditions and crafts. Hassan Fathy (1973: 39-45) places great emphasis on preserving local traditional building technologies as they are often cheaper, more suitable for the local climate and encourages the trade of local artisans. Hassan Fathy (1973: 39-45) highlights the architect's role in the preservation of such techniques, whereby local tradition and craft is favoured as opposed to imported ideals.

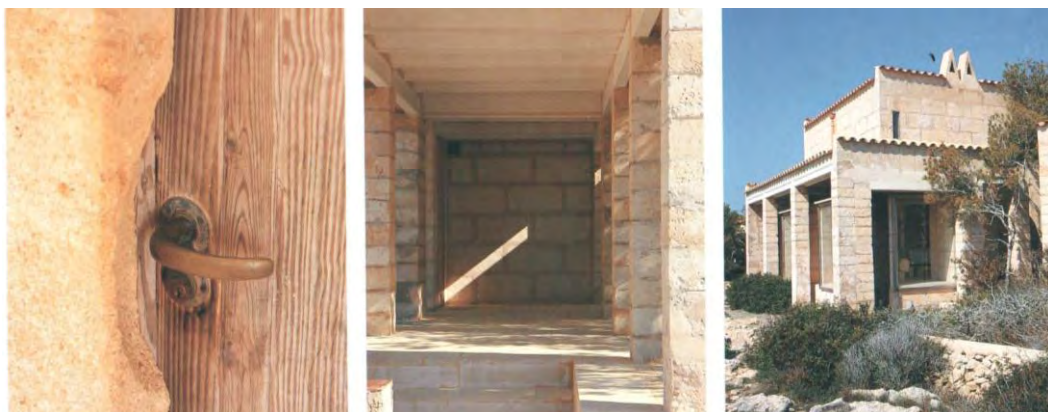


Figure 41 Can Lis, Majorca (Weston, 2008: 112)

How things are made and materials put together, the tectonics of the materials is an important factor in capturing an essence, which adds to the character of place, and allows the sense of place to manifest as Christian Norberg-Schulz (1980) suggests. Utzon's house Can Lis on

Majorca (Figure 41) is one which uses locally manufactured materials found on the island, and plays particular importance on allowing the materials to display how the buildings are put together. Local stone blocks are used and the circular marks from the saw, are not sanded down, allowing the grazing light to illuminate the traces of its past (Weston, 2008: 112). This method of construction, speaks to the phenomenological approach to design, whereby one is delighted by the detail.

#### **2.4.4 Ecological design response**

The primary function of buildings is to provide favourable habitable spaces to live, which provide adequate thermal comfort, as heat balance of the human body is a key aspect of human survival. While primitive man adapted his dwelling to provide favourable spaces with an understanding of basic physics of air movement and heating, thermal comfort today is viewed as providing constant stable engineered environments, independent of the natural environment. This method however has isolated man from the natural forces which have moulded him, while consuming massive amounts of fossil fuels for the purpose of comfort (Baker, 2006:4). Rayner Banham (1969) proposes that the environmental processes of a building should primarily be achieved through its form and construction, in a manner which ‘*selectively*’ filters the natural environment as a process of adaptation (cited: Hawkes, D, McDonad, J & Steemers, K, 2002:1). In this manner dependence on mechanical systems is reduced.

The idea of creating architectural spaces which engineer thermal comfort at a uniform temperature and air flow is one which has long been challenged. Lisa Heschong (1979: vii) in her book *Thermal Delight*, challenges the idea of thermal uniformity and the dissatisfaction of thermal variations. Furthermore Christopher Day (2004: 71-73) declares that air quality and thermal variance are among the factors which are essential for the stimulation of the senses which help one to stay alert, as is found in natural environments. Mechanically produced environments do not invigorate air quality. Natural air by contrast, carries scents and sounds of the seasons, weather, time of day and activities going on, consciously placing one within space and time, providing a multi-sensory experience of space (Day, 2004: 53). The design of buildings should therefore take into consideration ways in which spaces can be moulded in order to adapt to the local climatic conditions, for the purposes of thermal comfort. It makes both design and energy sense to take local conditions into consideration, as

different architectural responses is needed to suite different climatic conditions (Day, 2004: 43-46). Responding to real needs facilitates the creation of architecture which conveys authenticity and meaning, as Kenneth Frampton (1983) highlights in his 6 points for architecture of resistance.

Vernacular buildings often display greater connection to responding to climatic considerations as they have been adapted over years to perfect the mechanisms which facilitate thermal comfort, tailor made to suite seasonal variations, and local conditions. Hassan Fathy (1986: 6-9) warns that modern materials and systems may not necessarily be appropriate for certain climates, although they might be aesthetically pleasing. While traditional architecture evolved intuitively over long periods, it was based primarily on scientifically valid concepts. Therefore traditional solutions should be evaluated scientifically before they are disregarded or substitutes proposed (Fathy, 1986: 8-9). One such example of traditional understanding of climate can be seen by Middle Eastern wind-catcher, which enables natural ventilation vital in hot arid climates.

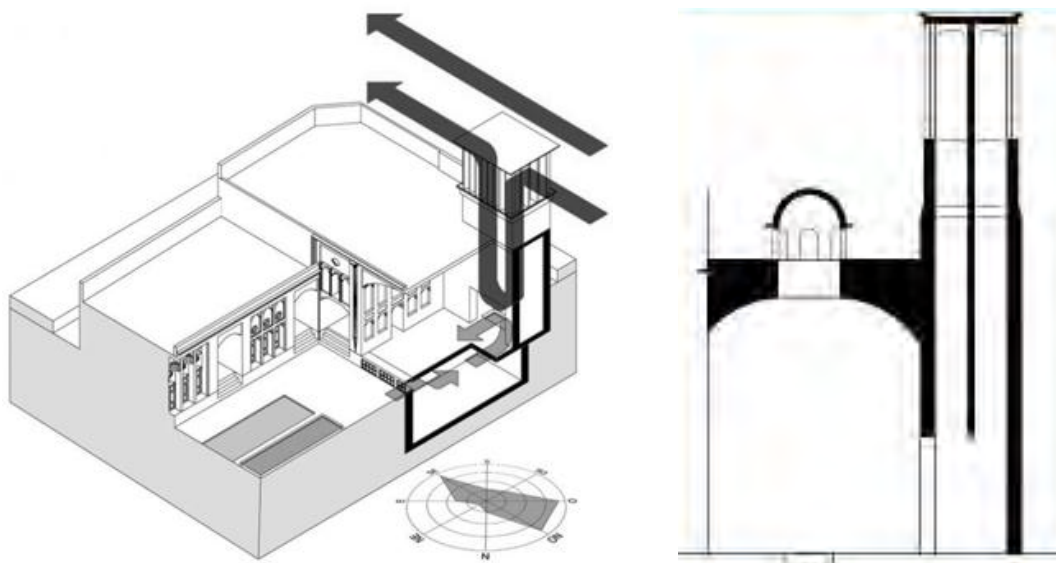


Figure 42 Wind catcher- Yazd (www.waset.org)

The wind-catcher is a customary Iranian building device, which plays an effective role in modifying the heat and adjusting the temperature of interior spaces in regard to thermal comfort, as it uses the convection created by wind flow and natural energy as exists in nature (Zarandi, 2009: 574).



The application of passive thermal comfort, through design interventions provides a means towards the creation of architecture of purpose. However, the application of such passive systems to large scaled building often becomes complex, as there is a greater diversity of people to provide comfort to. It is for this reason that thermal neutrality is often favoured over passive systems (Hawkes *et al*, 2002). Although this argument may be true, thermal comfort is a subjective matter and will vary in individuals, it involves a large number of physical and physiological variables, therefore thermal neutrality or uniformity does not adequately respond to the issue of thermal comfort (Baker, 2006: 5). Rather a model which promotes adaptive behaviour is a method of thermal control which promotes that, providing adaptive opportunity to the individuals in order for people to regulate their own temperatures should be used. This is done by the provisions of open-able windows, movable shadings devices, or other means such as clothing etc. Such process empowers the individual with choice which in turn yields a greater tolerance to varying environmental conditions. East-gate office building located in Harare, Zimbabwe is an effective precedent which utilises methods of passive design in order to provide thermal comfort in a large scaled urban building.

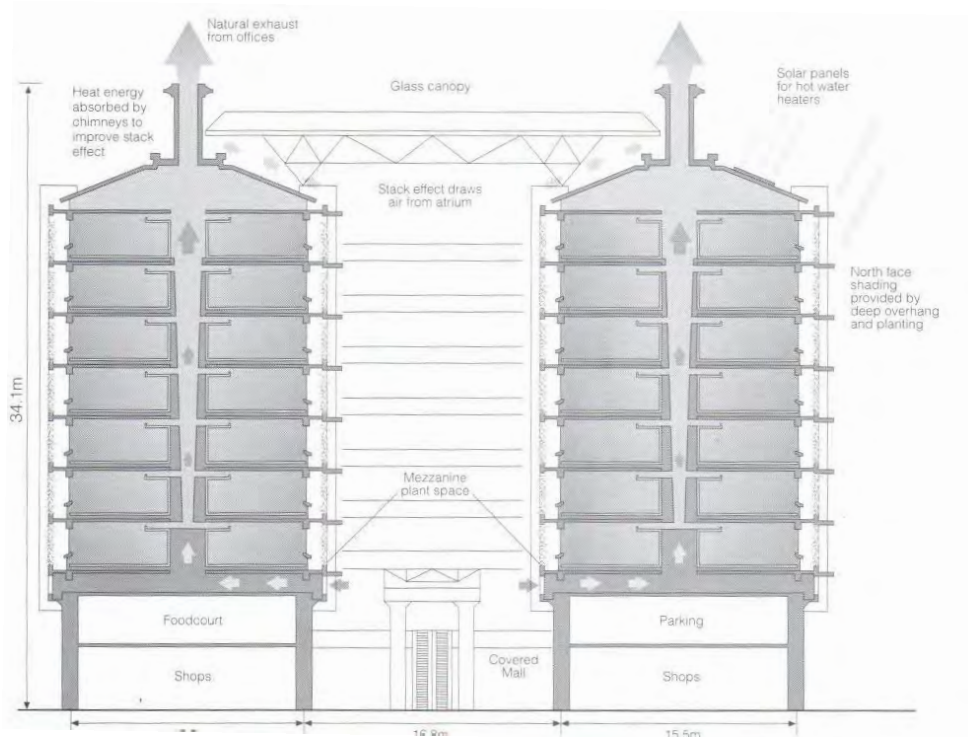


Figure 43 Section- East-gate Office Building, Harare, Zimbabwe ( Hawkes et al, 2002:105)

The plan is an arrangement of two parallel, nine story office blocks, separated by a full height atrium. It is constructed of in-situ concrete and brick cladding. Windows on its north façade is minimised to reduce heat gain. Open-able windows have filters to control glare and heat gain and are limited in size. The building is ventilated through a network of 32 vertical ducts, located at the core of each floor, which serves as a floor plenum and delivers air to the office space. Air is extracted through high level bulkheads which connect to a vertical shaft, which rise above the roof. While the system cannot deliver precision, it manages to effectively aid in the ventilation of the building and provide a circulation of fresh air as opposed to ventilated air. (Hawkes *et al* 2002: 102-108)

Overall healthy thermally comfortable spaces is more likely to be achieved through the adaptation of building to suite local climatic conditions, rather than providing with mechanically ventilated, cooled and heated spaces. Natural air is renewed through living processes in particular photosynthesis, which is rich in ions that promote health and life sustaining environments (Day, 2004: 57).

#### **2.4.5 Dynamic natural light**

*“Architecture is the masterly, correct and magnificent play of masses brought together in light. Our eyes are made to see forms in light; light and shade reveals these forms”* Le Corbusier: Towards a New Architecture (1923, cited: Ching, 1943: 174)

The sun is rich source of natural light which illuminates forms and spaces in architecture. The quality of sunlight is one which is manifest in the form of direct or diffused light, which varies with time of day, seasons and geographical location (Papanek, 1995: 78). As the luminous energy of the suns energy is dispersed by the clouds, condensation and haze, it transmits varying colours of the sky which in turn illuminates the surfaces of architectural forms (Ching, 1943: 174).

The most significant difference between artificial and natural light is the ability of natural light to change direction and intensity, creating rhythms as it moves through the day and from season to season and reveals and enlivens colours and textures. These qualities of light capture our attention and relieve mental fatigue and stress (Pollack, 2006: 39). Through the shifting and rhythmic movement of light the sun animates the space in the room, and articulates the forms within it. The manipulation of light can be used to create spaces which capture certain moods, as can be seen at Notre Dame Du Haut, France (figure: 44). Bright

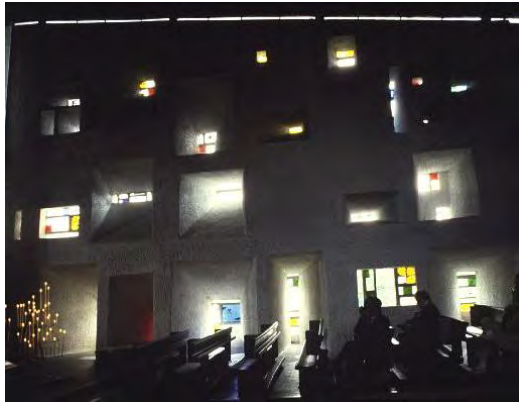


Figure 44 Notre Dame Du Haut, Ronchamp  
([www.bc.edu/bc\\_org/](http://www.bc.edu/bc_org/))

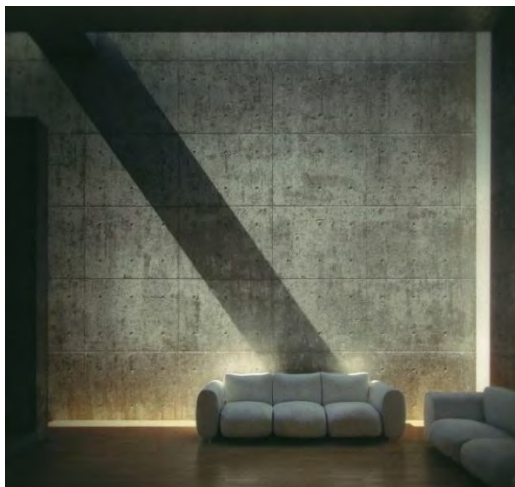


Figure 45- Koshino House- ([www.roarhitect.ro](http://www.roarhitect.ro))



Figure 46 Pantheon ([faculty.etsu.edu](http://faculty.etsu.edu))

brilliant colours of the sun can create a festive atmosphere or a room with diffused light can infuse a sombre mood (Ching, 1943: 174).

The use of light can either distort or clarify forms and may cause materials to appear lighter or heavier than they actually are. The use of light by Tadao Ando in his Koshino house (figure: 45), creates delicate light sculpture on the interior wall. The brightness of the light further gives a sense of lightness to the concrete wall.

Pallasmaa (2005: 46) emphasises that the eye is an organ of distance and separations as it surveys and controls, whereas touch is a sense which brings comfort and nearness as we approach things to touch. When things are brightly lit, shapes, forms, objects become sharp and these elements are brought into a focused vision, excluding the user from the space, however if the space is dimly lit, the peripheral vision is engaged which allows one to feel included with a space as opposed to excluded and invites the tactile haptic exploration and imagination (Pallasmaa, 2005: 46-49). The use of shadows allows for retreat, contemplation, comfort and imagination which is essential in architectural spaces, in providing spaces for withdrawal and privacy. Modern day buildings are often over glazed displaying activities to the street, in this way there is no privacy afforded to the user, and



Figure 47 Sofia Hagia  
(architecturepictures.tumblr.com)

there is a feeling of over exposure. (Pallasmaa, 2005: 49)

Dimly lit spaces are often used to exude a magical, mystical character. The Pantheon, for instance (Figure 46), its main hall is a dim hall lit by a single dynamic light source, the oculus, which sweeps across the hall gradually to create constant changing patterns of light and colour (faculty.etsu.edu). Hagia Sofia (Figure 47) is another precedent which demonstrates the use of light which provides a dimension to space which is both felt through the warmth and cool of shade and light and the variance of the glowing

light and dullness of shade. Decreasing the dominance of the sense of vision through the use of shadows and dimly lit spaces aides the other senses, this is especially so when it comes to aiding the spoken word, hence the importance of light in spaces such as theatres and spaces which engage an audience (Pallasmaa, 2005: 46-47).

Seasonal cycles of light intensity and duration, affect the human endocrine gland, affecting the amount of melatonin secreted which causes sleepiness. If overproduced, it may cause depression, as has been proven in Nordic countries (Papanek, 1995: 81). This condition has been named, SAD syndrome (seasonally affective disorder). Architectural spaces need to respond to these issues and can be used in a manner whereby light and sunlight is encouraged within indoor spaces, seeing as current lifestyles are increaingly focused indoors. Building strategies which allow natural light to penetrate deep inside buildings include, light shelves, clearstories, atria's, courtyards and light wells. The variation and sophisticated effects which light offers to a space allows us to explore and inhabit spaces. Its qualities are inspiring and are essential for healthy physical wellbeing.

#### 2.4.6 Water

Water is a life giving force and is essential for all life on earth. It is complex sources which exists in three states i.e. liquid, solid and vapour. In its liquid form, the movements, rhythms and sounds have the ability to induce moods within a space. Christopher Day (2002: 38) observes the ability of water to act as a stress relieving device stating: *"to follow ripples with*



*the eye is to be drawn to a soothing dream, washing away stress and invigorating our life's energies*". Water as a substance within spaces has a tremendous ability to induce moods of tranquillity, calm, awe or energy, by the manner in which it is used. Various spatial qualities used in conjunction with the manipulation of water create different moods. Apart from the sensory qualities of sound, movement and rhythms, water has the ability to cool spaces through evaporation as well as reflect light in a manner which is rhythmic and calming (Day, 2004: 52). However this precious resource is rarely used as an integral part of architectural design, and is often only featured as ponds in external landscaping features.

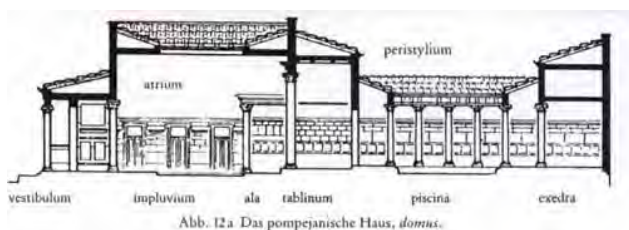


Figure 48 Section ancient roman house

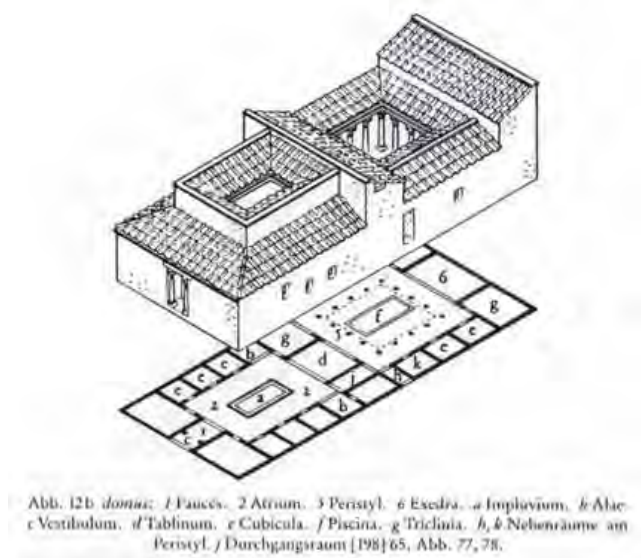


Figure 49 Axonometric: ancient roman house

Traditional architecture understood the importance of rain as a life giving source and its importance for the sustenance of earth thereby celebrated water in the form of rain (Krenz, 2007: 12). Modern architecture has shown disinterest in celebrating this natural phenomenon, vital for life. Modern buildings often favour a lack of roof, or flat roof which has become characteristic of the architecture of the last century, ignorant to the demands of natural weather conditions. Green roofs and roof gardens have been the only case where rain is welcomed. Architecture of past provides examples of ways in which rain can be celebrated within our built environments and connect us to the cycles of our natural world.

Such an example can be seen in the ancient roman house. Located at the centre of the house was the impluvium, the rain water pool, which was the first space to be encountered when entering the house. This rain water pool, acted more than just a cistern as the image of the sky was caught in it and the elements of sky, sunlight and moonlight were brought down into the

space of the house connecting the natural cycle of the heavens down to earth (Krenz, 2007: 16). The response to the collection of water for the purpose of re-use was one which was poetic and symbolic, and enriched the experiential value that celebrated the act of rain collection and its enriching sensory qualities. As we have become ecologically aware of the importance of rain water collection in recent years, there has been an increase in domesticated rain water harvesting, however these methods are rarely as poetically displayed as the response of ancient Rome.

Often natural experiences provide bases from which architectural spaces may take inspiration. Peter Zumthor, in his Thermal baths (figure: 50-52), in the Swiss Alps, takes inspiration from the qualities of water as experienced in a natural cave. The sensory experience of the building thereby evokes qualities which is unique and provides a sensory quality which is not often experience, creating a mystical and magical experience (Fischer, 2008: 278-279). The building highlights the typical elements of the Alps, such as the mountains, stones, water and nature and uses locally occurring quartzite (Fischer, 2008: 278-279). The use of quartz and the play of light and shade evoke a sensory quality similar to that of a cave. The thermal waters from the hot springs in the mountain are inserted within the



Figure 50 Thermal Vals (archdaily.com)

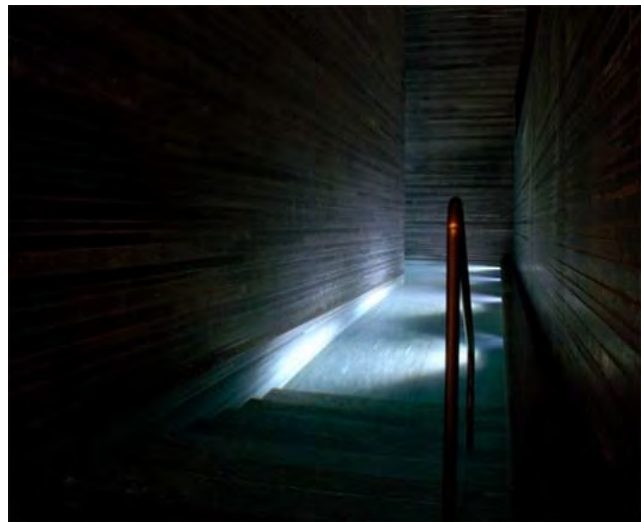


Figure 51 Cave like interior pool (archdaily.com)

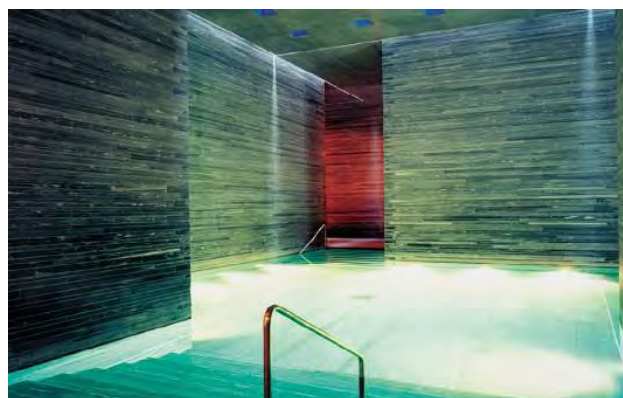


Figure 52 Natural light from slits in roof add a dynamic quality to the rhythms of water (archdaily.com)

man-made cliff like formation. The sounds of water, voices and steps, echo off the high walls, further imbuing the space with a cave like mystery (Fischer, 2008: 279). The mystic qualities of stone within the mountain, darkness and light and its qualities reflected by water, the sensory quality of air thick with steam, the unique acoustics and sensory delights within these mystical spaces, are notions which guided the formation of spaces (archdaily.com).



Figure 53 Byodo-in, Kyoto, Japan  
(Moore, C.W & Lids, J, 1994:14)



Figure 54 Carrasco House, Spain  
(Moore, C.W & Lids, J, 1994: 177)

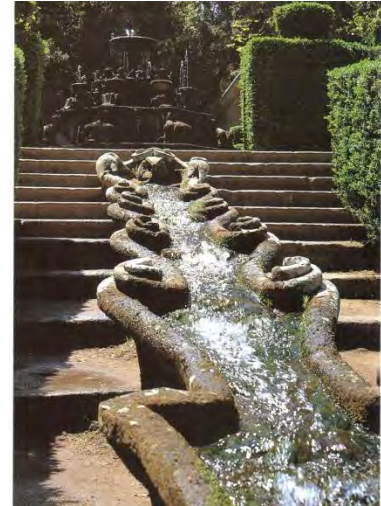


Figure 55 Villa Lante, Italy  
(Moore, C.W & Lids, J, 1994:33)

The use of water in architecture, like any other element in architecture, can be used in a manner which orchestrates various results, some which may not necessarily be pleasing. Therefore due consideration should be given to the sounds and visual aspect of water in respect to its space and context (figure: 53-55), in order to produce satisfying results (Moore, C.W & Lids, J, 1994: 200-202).

#### **2.4.7 Frequent opportunities for interactions with nature through natural landscapes and gardens**

As lifestyles gravitate towards being primarily indoors, it is becoming increasingly important for architectural design to incorporate spaces which allow connections to the natural world wherever suitable. Principles found in biophilia promote interactions with natural elements, vegetation and habitats whenever possible (Almusaed, 2011; Beathly, 2011). From early civilisation, man has explored the concept of incorporating the ideal image of nature within the built-form through the incorporation of gardens (Aben, R & Wit, S de, 2001:10). Gardens,



by definition are spaces of peace and tranquillity, which man has associated with the idea of paradise. It is representation of life sustaining forces, nourishment and fertility. Such spaces have been used throughout time to allow man to intimately engage with aspects of the natural world in a condensed manner. Gardens are thereby a formal representation of nature, a place which unites nature and culture through order, which is a natural instinct of man (Aben,R & Wit, S de, 2001: 10-11). The structuring of nature to suite man's ideal vision of nature provides man with an appreciation of the natural world, connecting him to the natural forces.



Figure 56 Chaniwa(tea) garden (asiawelcome.com)



Figure 57 Chaniwa(tea) garden (asiawelcome.com)



Figure 58 Zen garden, Japan (Moore,C.W & Lids, J, 1994:35)

Classical gardens as found in the Chinese and Japanese culture (as explored through Taoism, Buddhism and Confucian philosophies) explores the principle of creating harmony between man and nature (figures:56-58). The Tao philosophy inspires its followers to be profoundly conscious of the process of change in nature. This humility in the face of nature is thereby reflected in the design of landscapes and the adaptation of buildings to site (Yu, 1993: 3). Often it is the ideal pictures, as described through literature, which is reflected in traditional gardens and man-structured “natural” landscapes. The incorporation of nature and the cycles of nature in the form of enclosed gardens within the built form is a concept used from the early times and explored across varying cultures.

The fundamental principle for an enclosed garden is the containment of space for the purpose of growing plants. The form of landscapes is determined by its horizontal alignment, which is transformed into a vertical alignment within an enclosed garden. The garden is a formal representation of nature in a condensed form. These gardens often reflected the microcosm and represent a mirror of the soul, of man, the cosmos and paradise (Aben,R & Wit, S de, 2001: 11). Entering the opening of the enclosing wall transports the user into a magical world, a secret garden a mystical experience. The most eloquent of examples of enclosed gardens is found in the Palace gardens of Alhambra (Granada, Spain) pictured below (Figure 59).



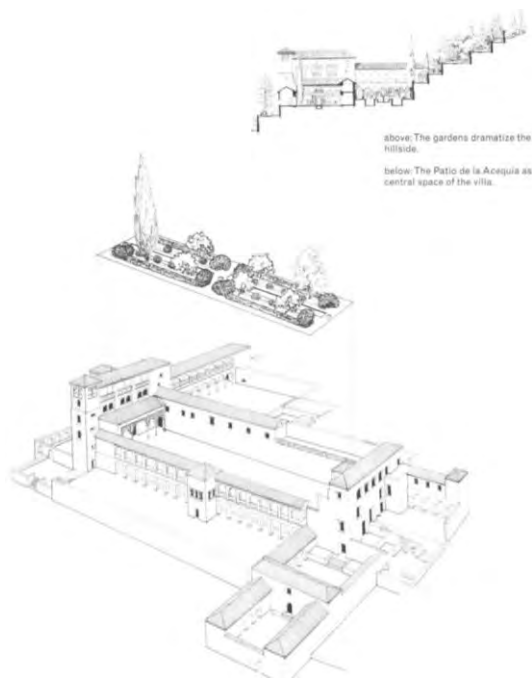


Figure 59 Patio de la Acequia- Axonometric view, Alhambra, Spain (Aben,R & Wit, S de, 2001:67)



Figure 60 Patio de los Leones, Alhambra, Spain (Aben,R & Wit, S de, 2001:117)

The palace is built around two courtyards, which constitute the principle foci in the forts spatial organisation. The gardens reflect Islamic traditions and imagery of paradise, utilising fountains and sensuous fruit trees. Such spaces promote and invite outdoor living, for eating, making music and conversing. The spatial organisations of the built form around enclosed gardens often open up through permeable circulation routes, linking the vegetated sensuous garden spaces to the interior spaces of the building as illustrated in Figure 59-60. Through this manner man connects to natural spaces as he goes about his daily functions and moves from place to place.

Gardens and landscaping within architecture is a conscious attempt at connecting man to place, time and the natural environment. Thus the aesthetics revealed in such spaces is a synthesis between nature and man's ordering disposition as revealed through cultural traditions.

## 2.5 CONCLUSION

The above discussions outlined the elements which add life enhancing qualities to architecture and architectural space. It has been highlighted that the experience of space is a multi-sensory experience. Thus architecture should incorporate elements which shall orchestrate life enhancing spaces fit for human habitation. The aspect of place bound architecture is rooted in time and place and is revealed through the cycles of the natural world which help in connecting man to place and time. The loss of place is amongst the failures of contemporary architecture, which has cause social and environmental degradation. The following two chapters shall look at key precedents and case studies respectively, bearing in mind the concepts and theories explored in this chapter.

## CHAPTER: 3 KEY PRECEDENT STUDY

### 3.1 INTRODUCTION

This chapter shall explore two key precedent studies which illustrate concepts and theories as discussed in the literature review. The precedents to be explored are the Africa centre for population studies (by east coast architects) and the Bank of San Jose, Rohrmoser (by Bruno Stagno)

### 3.2 AFRICA CENTRE: FOR HEALTH AND POPULATION STUDIES, SOMKHELE, KWA-ZULU NATAL BY EAST COAST ARCHITECTS



Figure 61 Africa Centre ([www.eastcoastarchitects.com](http://www.eastcoastarchitects.com))

#### *Background*

The Africa centre was established as a health and population research facility established by three research institutions namely: - the medical research council, University of Natal and the University of Durban Westville (KZNIA, 2002: 8). The facility is located in the District council of Umkhanyakude, on a 13 hectare site which is at the heart of the research area. The

site crests a hill and has views to an undistinguished valley amidst a scattering of homesteads; views to the south are of the white Mfolozi river valley and to the north the hills of the Hluhluwe game reserve (Digest of S.A architecture, 2003: 62).

*Layout and formal composition:*

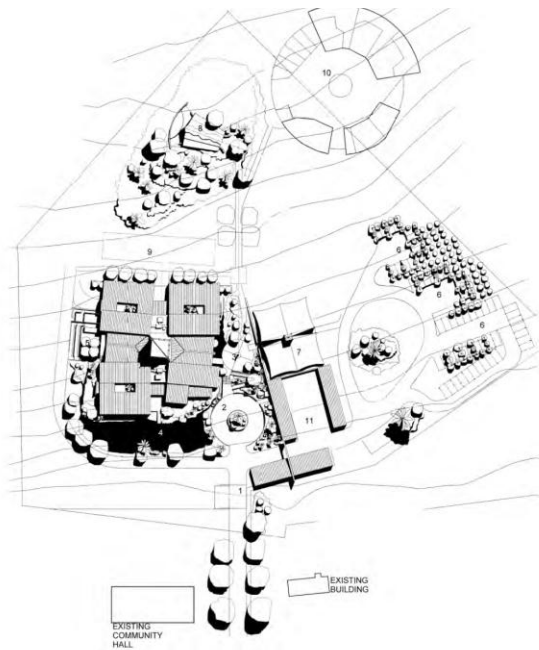


Figure 62 Africa Centre Site plan (eastcoastarchitects.co.za)

The generator of the formal composition of the building can be seen to be greatly influenced by the natural climatic factors. The layout of the building maximises on the benefits of natural daylight, ventilation and passive thermal comfort strategies while facilitating good social interactive spaces. The main building is comprised of four research 'pods' which cluster around a central cruciform shape housing the social functions of the building (refer to Figure 62) (www.eastcoastarchitect.com). This central space acts as the social heart of the building facilitating interactions between the four research 'pods'.

Previous design concepts for the centre incorporated smaller buildings in various arrangements to maximise on natural lighting, facilitating connections to exterior environment and allowing for future growth, however these concepts were discarded as it did not encourage collaborative research between the individual buildings (Figure 63). Thus the idea of a social hub for collaboration and interaction became one of the main form generators (KZNIA, 2002:7).

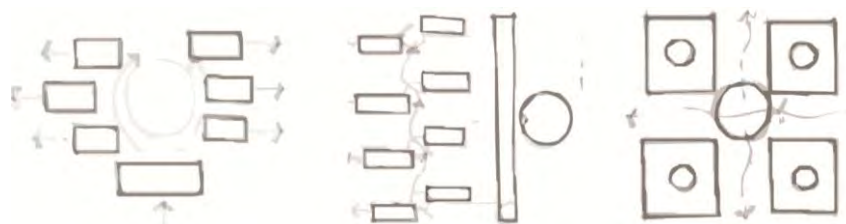


Figure 63 Evolution of Conceptual development- Africa centre (KZNIA, 2003: 7)

The resultant building with a central social heart is given a sense of presence by means of a 15 meter tower providing a reference point for both the users of the building and acting as a landmark when viewed from the landscape. The building is thereby given a sense of presence within the landscape.

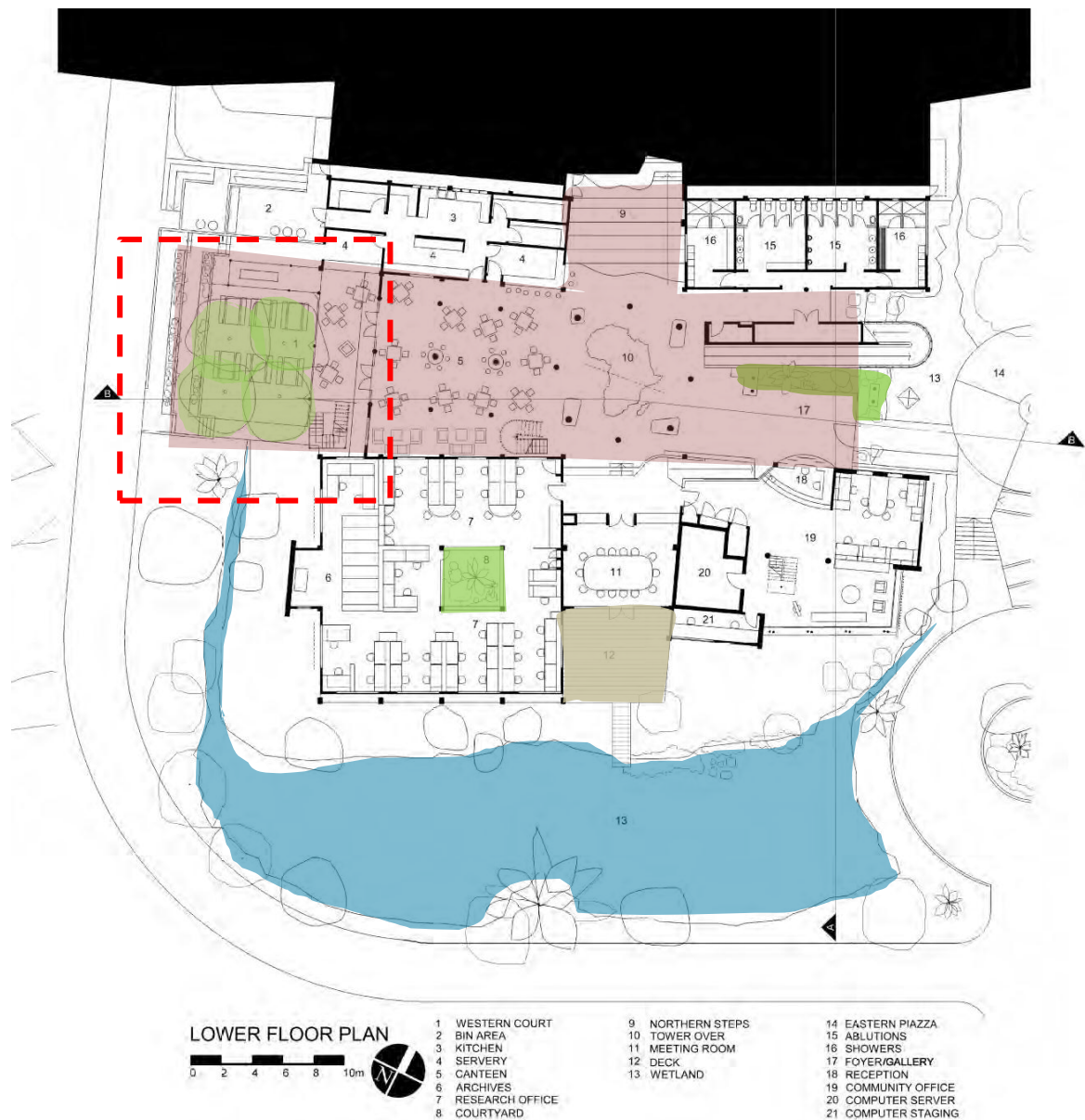


Figure 64 Ground floor plan ([www.eastcoastarchitects.co.za](http://www.eastcoastarchitects.co.za))

The ground floor which is the social hub of the building is found to seamlessly connect to the external environment as landscaping and vegetation is incorporated as part of the design. The western court (outlined in red) incorporates trees and is a space which creates an intermediate



zone between inside and outside. The sense of permeability created by the layout of ground floor and through the use of various materials and courtyards connects the building to the natural environment. This approach roots the users of the spaces to the locality, the time and place, a concept promoted by place theory and phenomenological approaches to design.



Figure 65 Research pod office space ([www.eastcoastarchitects.co.za](http://www.eastcoastarchitects.co.za))

It is found that central to the design agenda is the creation of life enhancing spaces through passive design and integral connection with natural elements such as water, light, air and vegetation. In responding to the creation of spaces which are climatically suited, the building composition responds in two scales. Firstly in the scale of each research ‘pod’, as the ‘pod’ is designed as open plan offices around a central courtyard ensuring maximum exposure to natural light and ventilation with the maximum distance from any workspace to the nearest source of ventilation or natural light being a mere 3 meters (KZNIA, 2002: 7-10)

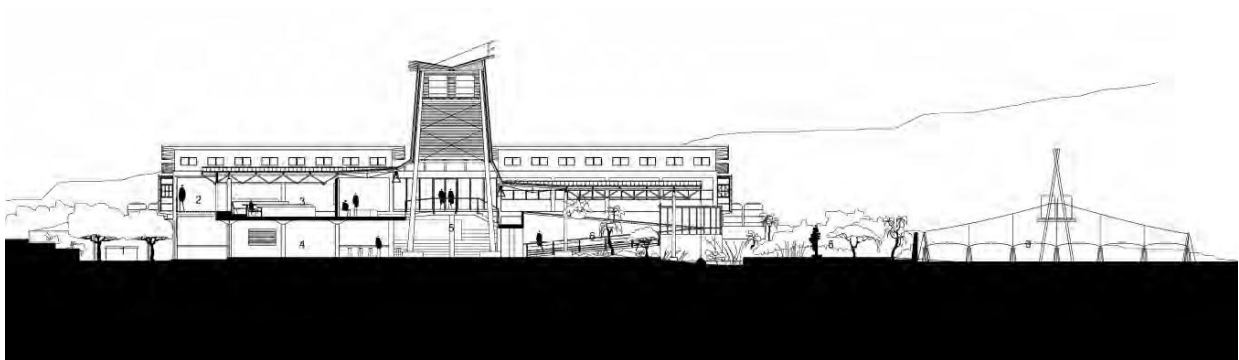


Figure 66 Section: Africa Centre ([www.eastcoastarchitects.co.za](http://www.eastcoastarchitects.co.za))

Secondly the form of the building responds climatically in its entirety as the central water tower feature induces ventilation for the central spaces of the building as a whole. The tower takes advantage of the stack effect to induce natural ventilation. Passive airflow by the tower is encouraged by heating the corrugated iron cladding around the tower through solar radiation, which in turn heats the air in the 300mm shaft around the perimeter of the tower. As this air rises and expelled through the top of the tower, cooler air is drawn into the building from landscaped areas and water features (Digest of S.A architecture, 2003: 63). To reduce solar gain, various solar shading devices in the form of lattice screens are utilised and adapted to suite the orientation. Vegetation in the courtyards helps to provide cool, fresh oxygenated air.



Figure 67 Entrance to Africa Centre, depicting various materials and construction  
([www.eastcoastarchitects.co.za](http://www.eastcoastarchitects.co.za))

The materiality and construction of the building primarily uses local materials and local artisans to encourage a locally suited design aesthetic (KZNIA, 2002:7-10). Such considerations convey a critical regionalist approach to design. The construction techniques and detailing are left exposed and conveys a sense of tectonics and understanding of the structure of the building. This adds a sense of honesty to the building as the true gravity of the building is conveyed. Frame concrete construction is employed allowing for the use of various non-loadbearing materials (KZNIA, 2002:7-10).

The idea that water is a precious resource which should be carefully considered in design is one which the literature review emphasised, and is seen to be considered greatly in the design

approach of the Africa Centre. Various strategies are applied to respond to the aspect of water. Firstly water harvesting is considered as the various mono pitched roofs channel water to water storage tanks. Secondly there is the grey water system which utilises grey water from low pressure showers and basins and reuses it for gardening and landscaping purposes. Thirdly storm water runoff is channelled to the wetland feature (highlighted in blue in figure 64) or other natural wetlands found around the site area. Lastly sewage is treated on site and treated water is utilised for the purposes of landscaping and plantations.

Overall the building can be seen as a living organism as the design addresses the way the building breathes (ventilation), is lit (natural lighting), its sustenance (water, vegetation and human activities) and its waste ( water and sewage). These processes are considered in a holistic manner to benefit both man and the environment

### 3.3. BANK OF SAN JOSE, ROHRMOSER. BY BRUNO STAGNO



Figure 68 Bank of San Jose ([www.brunostagno.info](http://www.brunostagno.info))

The bank of San Jose is situated in a tropical context of Costa Rica which dictates much of its design response. In keeping with the traditional corporate image of the bank, the building expresses itself in a similar manner to promote its corporate image. The building consists of a complex three dimensional structure which places a great emphasis on the design of the roof of the building. This is done so as to respond to the complex multi-sensuous tropical context the building is situated in.



Roofs within the context of a tropical region are a critical element of design. The size, its presence and expressive forms make it the centre piece of tropical architecture (Tzonis, et al., 2001: 173). The functions of the roofs in this context are various, some being: illumination, ventilation and shading as well as the primary function of protection from the sun and rain. The articulation of the form of the roof influences the interior expression of space and is manipulated to add character to the building. Figure 69 illustrates the complex makeup of the roof structure.



Figure 69 Roofing articulation- San Jose Bank ([www.architectureweek.com](http://www.architectureweek.com))

The roof design of the San José bank is articulated and designed in a manner whereby there's a multiplicity of floating roofs mounted on ridged frames. The composition of these 'leaf' like roofs allow natural light to pass through the controlled apertures which have been

designed so as to allow cool light within the building and avoid solar gain through direct sun exposure. Thus the interior space is primarily dominated by shade (Tzonis, et al., 2001:180-181). The use of light is often a preoccupation within architectural theories, however it is important to note that both shade and light should be considered simultaneously as the one is defined by the other. In varying contexts either shade or light is more greatly appreciated. In the context of a hot arid space, shade is within the built form is appreciated and within a gloomy space, light is the element is appreciated more. In the case of the Bank of San Jose and buildings in tropical regions shadow acts as the defining element within the interior space, as the coolness of shade is the element which allows people to be active within such contexts. This design consideration places human wellbeing at the centre and becomes a source of passive energy ([www.architectureweek.com](http://www.architectureweek.com)). Figure 70 illustrates the quality of light created by the articulation of the roof and controlled apertures.



Figure 70 Illustrating the quality of light filtered in and the tectonics and materiality of the structure  
([www.brunostagno.info](http://www.brunostagno.info))

The materiality of walls and window sizes are primarily determined by climatic considerations as the building is located in a hot and humid area which requires good ventilation. Thus the wall thickness is kept to minimum, window sizes are maximised and interior layouts are airy and spacious to allow breezes to move freely without much interference (refer to Figure 72 for plan layout). The structure and materiality of the building is left exposed and a contrast of solid wall and permeability of the glass and steel structure enhances the tectonics and qualities of the materials of the building (Tzonis, et al., 2001:181). The transparency of the walls creates a counterpoint to the vast open space under the articulated roof. The space is allowed to fuse outwards while being contained under the protection of the roof (Tzonis, et al., 2001:181).

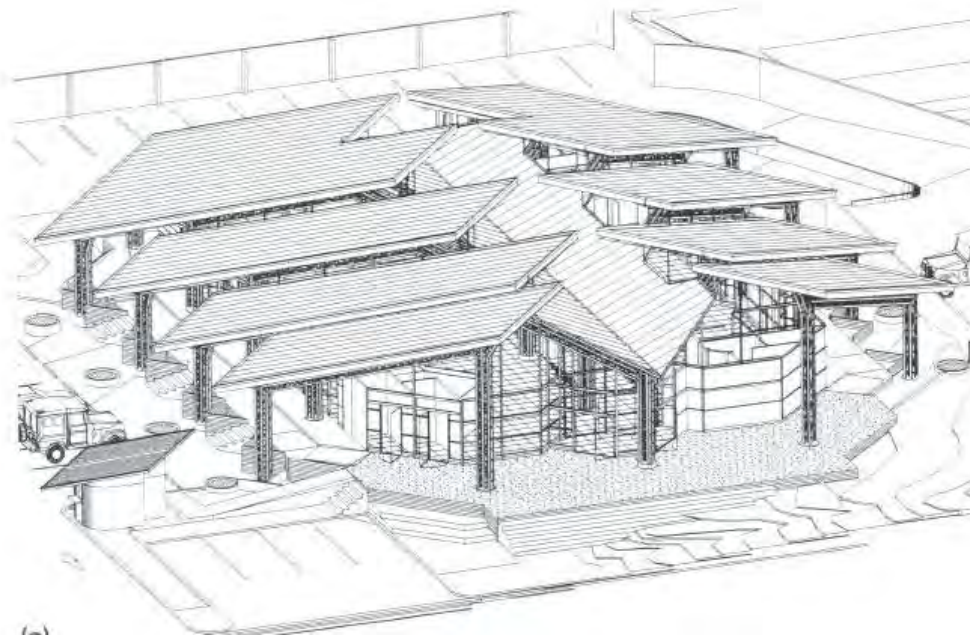


Figure 71 Southern Axonometric view (Tzonis, et al., 2001:187)

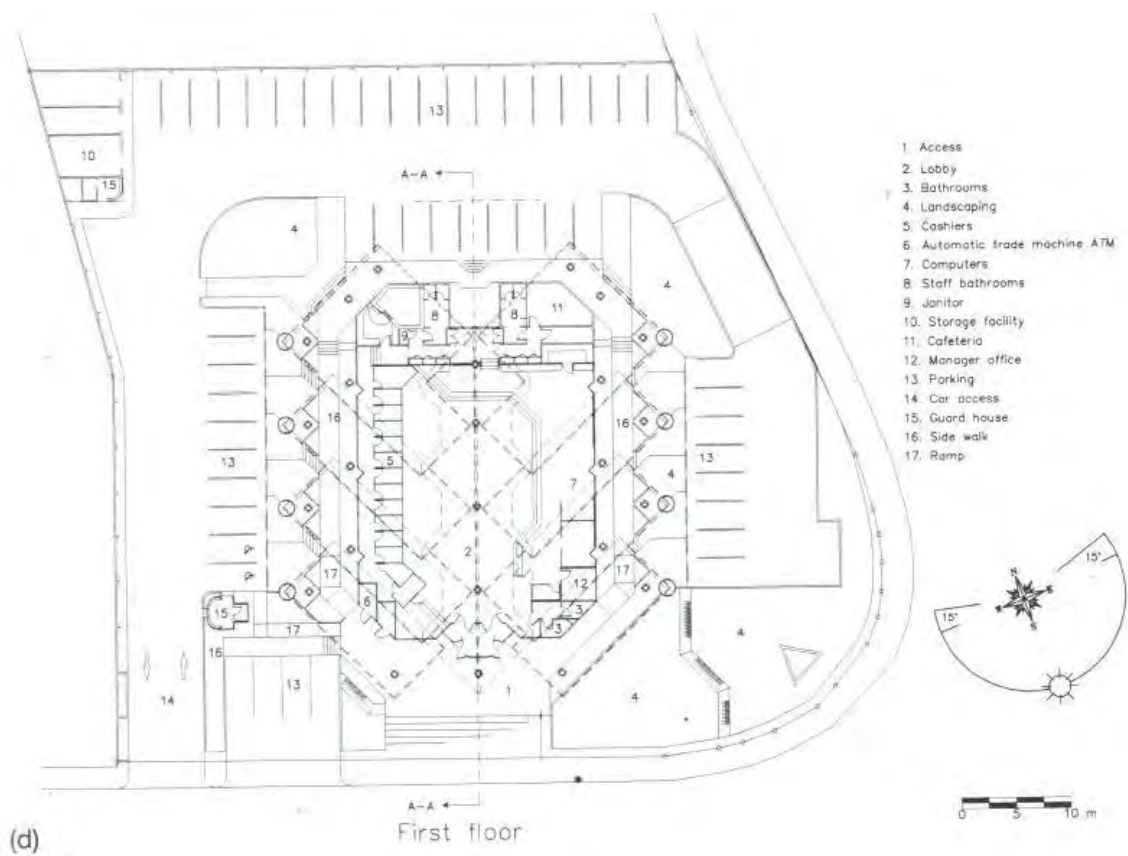


Figure 72 Plan of Bank of San Jose, Rohrmoser (Tzonis, et al., 2001:187)



The transition between inside and outside is seen to be an important theme in the design of the building as structural elements extend past the boundary of the walls. On this transitory space Bruno Stagno states:

*“...the transition is an opportunity to characterise tropical architecture beyond the traditional umbrella and convert it into a truly architectural entity. It is in this space where the building is refreshed, where the light is subdued, where shade invades the apertures, and where the breeze improves ventilation.”* (cited: [www.architectureweek.com](http://www.architectureweek.com))

Figure 73 illustrates the detailing of the transitory space, which articulates the elements of light, air and heat before reaching the interior space. On this edge where two boundaries meet, where one is neither outside nor inside, one is allowed to experience the natural and varying qualities of the exterior environment while being provided with a sense of enclosure.

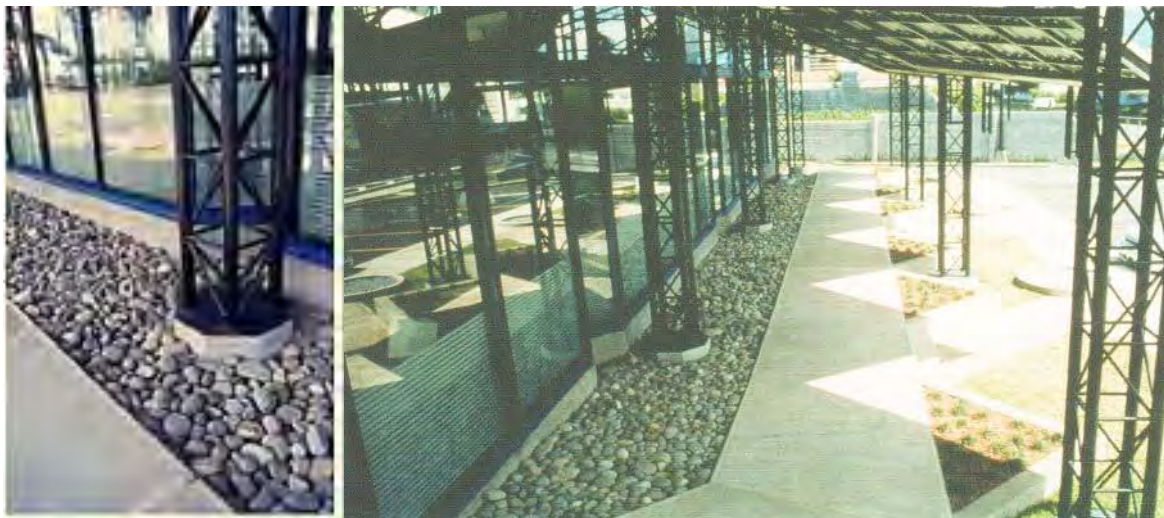


Figure 73 Inside-outside relationship ([www.brunostagno.info](http://www.brunostagno.info)) & (Tzonis, et al., 2001:88)

The language of the building in responding to the climatic considerations speaks to the traditional architecture of the tropics which places emphasis on the roof forms thus relating to the culture of the place. Such approaches of carefully considered architecture in relation to climatic conditions and human wellbeing is seen to allow a place bound architectural aesthetic to manifest, the use of modern materials illustrates the possibility to create architecture which is both modern yet in tune with the culture, place and region.

## CHAPTER: 4 CASE STUDIES AND FINDINGS

### 4.1 INTRODUCTION

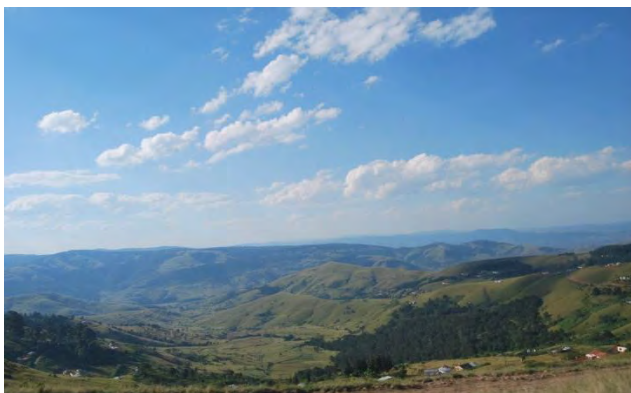
The following section shall discuss and analyse case studies which are relevant to the study at hand. Three case studies have been chosen to observe aspects as set out by the theoretical framework in varying contexts as this shall provide a larger scope to which the understanding of the theoretical framework may be applied. The analysis is carried out taking into consideration responses from interviewees where possible, journal articles and observations of site, thus revealing challenges faced in the varying contexts. The case studies are: the Ixopo Buddhist Retreat Centre, the Green Hub located at the uMngeni river estuary, Durban and Binder Dijker Otte House (hereto referred as B.D.O House), Umhlanga.

The case studies are analysed under the following criteria:

- Background and justification of study
- Sense of place
- Boundaries
- Ecological response
- Materiality
- Life imbuing Qualities of the natural environment- light, water, vegetation and landscape

### 4.2 BACKGROUND AND JUSTIFICATION OF CASE STUDIES

#### 4.2.1 Ixopo Buddhist Retreat



The Ixopo Buddhist retreat centre , located near the town of Ixopo , is set upon the ridge of the hilly grasslands, surrounded by indigenous forest and bushes and overlooks one of the great valleys of the Umkomaas river systems (BRC brochure,2012).

Figure 74 Ixopo- setting of the Ixopo Buddhist Retreat centre (Author:2012)

The facility was chosen to illustrate how a connection to the natural environment is made in a natural setting, specifically in responding to the spirit of the place. While the centre is dedicated to Buddhist retreats, the principles used promote a sense of connection to the natural world.

#### 4.2.2 Green Hub, uMngeni River Estuary, Durban

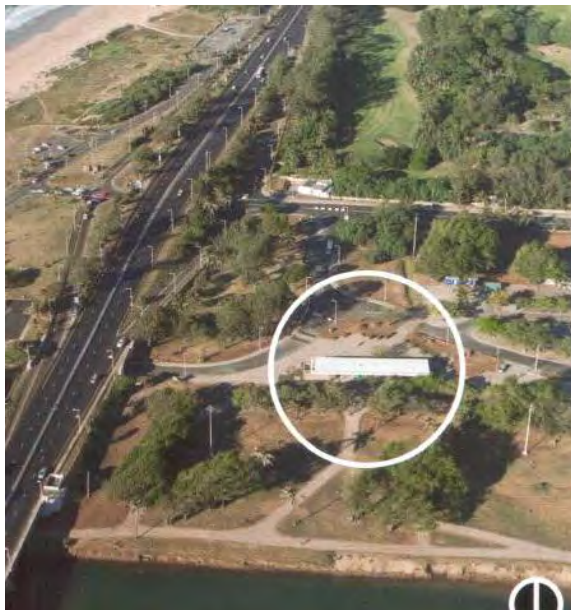


Figure 75 Ariel view: Green Hub (KZ-NIA, 2011:12)

The Green Hub is located at the uMngeni River estuary, a few minutes away from the Durban C.B.D. and is central to the cities green corridor initiative. It serves as an eco-tourism information centre which promotes local environmental clean-ups, access to outdoor activities for the city's residents and educational programs for general public ([www.durbangreencorridor.com](http://www.durbangreencorridor.com)). The building was chosen to assess how connections to the natural environment may occur within a natural site located in an urban context.

#### 4.2.3 BDO House, Umhlanga, Durban



Figure 76 BDO House on approach to the building (Author:2012)

BDO house, a contemporary development (completed in: 2011), is part of emerging office park trends in urban planning. It is located in Umhlanga, Ridgeside Office Estate. It is representative of medium scale buildings within an urban context. Contemporary developments often place an emphasis on sustainable imagery with current environmental concerns; however these approaches are frequently technologically driven which ironically distances the connections to the natural world (Crowe:

1995:22). The case study is chosen to illustrate ways in which buildings with greater

functional requirements may provide a sense of connection to the natural environment while effectively facilitating the functional requirements.

### 4.3 SENSE OF PLACE AND CONTEXT

Responding to the sense of place (as discussed in the literature review) is found to be an important factor in grounding architecture to place and the natural environment. Architectural responses are said to concretise the character of a place (Norberg-Schulz: 1980: 8), with the sense of space being most strongly felt when local and natural factors are taken into consideration. Among the main aspects of sense of place, is the dialogue buildings create with its immediate context, topography and natural climatic conditions.

#### 4.3.1 Analysis



Figure 77 View of accommodation chalets and communal accommodation (Author:2012)

The Ixopo Buddhist Retreat is set amongst the rolling hills of rural Ixopo and has a distinct sense of place in a landscape which could be termed as a combination of a classical and romantic landscape, as defined by Christian Norberg-Schulz (1980: 42). Site visits revealed that the buildings converse with the landscape in a manner that allows the buildings to blend and belong in its context. Correspondence

with the architect revealed that the manifestation of the sense of place arose due to the intuitive method of construction which allowed for greater flexibility and creativity to respond to opportunities on site as they revealed themselves (Appendix:1.1). Louis (2012) states that the buildings thereby responded in an organic manner in relation to the site without the constraints of intellectual interception and specifications (Appendix: 1.1). Furthermore, the development of the buildings on site occurred in a slow manner spanning a number of years, as needs arose and funds became available.





Figure 78 Arrival: Green Hub (Author:2012)

In contrast to the rural setting of the Ixopo Buddhist retreat, the green hub is located within the urban context of KwaZulu-Natal, and developed in a fast paced manner, within a period of five months after receiving the brief (Hunt, 2011: 12). The building reveals a very different sense of place. The journey to the site by the author was undertaken by means of vehicular transport, which passed through the urban environment. On reaching the site, there was

a sense of calm and tranquillity which contrasted the very busy experience of getting to site. Such contrasting experiences enhanced the tranquil experience of arriving at the uMngeni river estuary. This notion of contrast empowering certain experiences is explored by architects such as Tadao Ando as discussed in Chapter: 2. It is through contrasting experiences that one appreciates certain aspects of space.

The Green Hub stands as a simple transitory and permeable element within the landscape thereby blending in with the natural landscape (as revealed by site visits). Both the design responses from the Buddhist retreat centre and the green hub are relative to the human scale encouraging human engagement on the ground level.



Figure 79 Arrival at B.D.O House (Author:2012)

Visits to B.D.O house by contrast displayed a sense of alienation, as the building does not engage with the human experience of the external space nor does it encourage human activity on ground level. This revealed the importance of creating architecture with the understanding that a building is experienced both on the interior and the exterior. It is therefore vital that buildings are designed in a manner which

responds to the human experience of not only the interior space, but the exterior as well, thereby allowing a sense of place which is welcoming to the human experience to manifest.





Figure 80 Ariel view of Ridgeside office park development (<http://www.ridgeside.co.za/>)

The context in which B.D.O house is located is the Ridgeside office estate development. On observation of the development in general it was found that the buildings made little relation to each other, often only referring to themselves. Such responses display a sense of placeless-ness, as each building is viewed as a separate insular entity, with its own imagery making little or no connections

with each other. It would be recommended that shared facilities such as a gym or café for instance would enable connections to be made between buildings therefore encouraging users to transverse along the exterior spaces of the development. The lack of human activity leaves the place seemingly desolate. Also revealed through site visits was the preference given to the vehicular related functions which further fragments and separate the various buildings. The lack of conversation and connections between buildings, the individualistic behaviour and the lack of conversation with the exterior experience of the building project an alienated sense of place.

#### 4.3.2 Findings

The above discussions have revealed a few essential aspects in relation to the spirit of place, these being:

*Context:* in responding to sense of place the context of the building must be taken into consideration. The relationships between buildings, topography and the creation of external spaces thereof are important factors.

*Relation to ground level in respect to human activity:* buildings which relate to the human experience of the external space are found to be more inviting. The built form should simultaneously create exterior and interior spaces relative to the human experience. The articulation of external space may not always relate to the human activities, but should take into consideration the emotive qualities varying responses may evoke. The emotions being evoked should have meaning and should be thoughtfully done. The sense of place can therefore said to be in relation to the human understanding and emotional experience of the exterior space.

*Importance of relating and connecting in respect to urban areas:* the idea of relating and making connections has a greater importance within an urban area where a number of buildings begin to affect the landscape and the way it is experienced. In a natural context the connections to natural landscape and the natural topography allow a place bound sense of place to manifest.

#### 4.4. BOUNDARIES

The experience of space is found to be rooted in the manner in which membranes or boundaries are articulated in order to separate, converse with or connect between two realms. Pallasmaa (2005) and Day (2004) both express the aforementioned sentiments emphasising that the quality of the experience of space should not be confused with the resolution of the form of the building as this may not necessarily result in a well-orchestrated experience. The manner in which the building converses through these membranes is essential in assessing whether the building facilitates in providing connections to the natural environment. The boundaries of the buildings shall be assessed regarding three relationships, these being: the inside outside relationships, the ground to building relationship and the building to sky relationship.

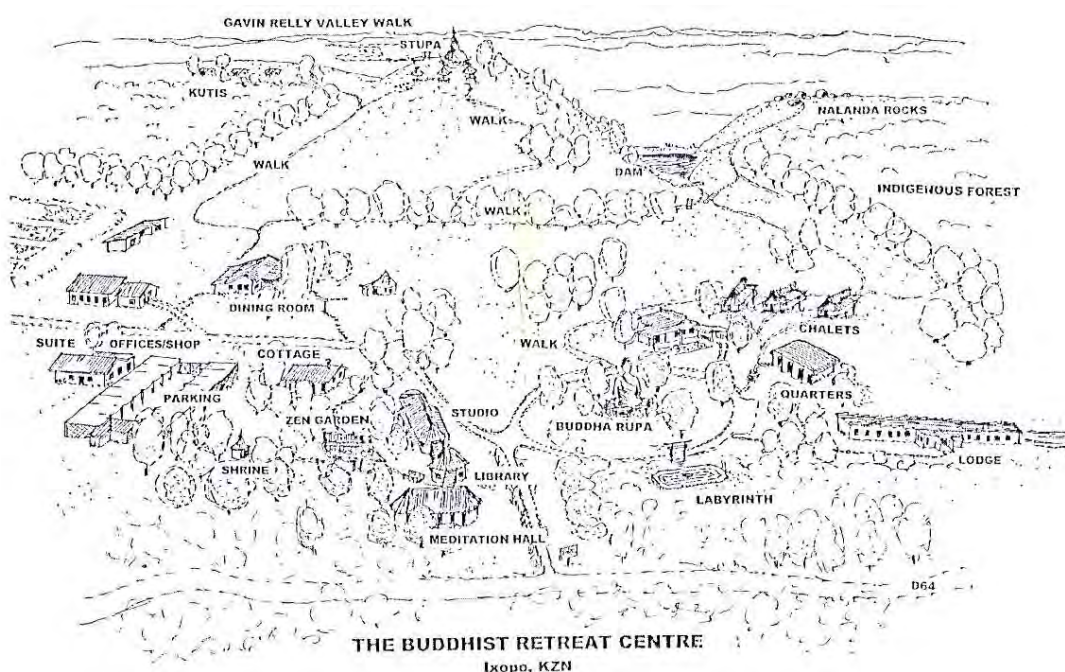


Figure 81 Map illustrating layout of buildings which make up the centre ( BRC-brocher:2012)

#### 4.4.1 Analysis of case studies

##### *Inside and outside relationships*

The Buddhist retreat centre is made up of a number of buildings set within the landscape serving varying activities, such as mediation hall, accommodation etc. Site visits revealed that the various buildings are connected through paths within the landscape (Figure 81). This method was found to encourage conscious awareness of place, as one moves from function to function. Louis (2012: Appendix: 1.1) states that such shifts in one's experience consciously places man in the here and the now, in space and time. Furthermore, such an approach leaves the user vulnerable to the external conditions, which allow the user to engage with the forces of the natural world as opposed to being constantly shielded. The experience of moving through space is thereby constantly varying and stimulating in a subtle manner as the user is allowed to observe the subtle changes in the natural world.



Figure 82 Veranda Space allowing one to sit along stone benches and observe the natural landscape (Author:2012)

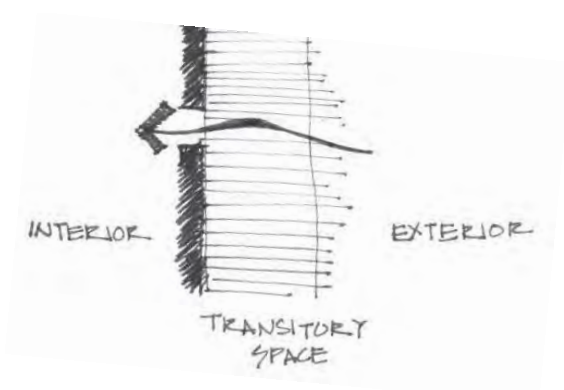


Figure 83 Illustrating the blending of interior and exterior thresholds through transitory spaces such as the veranda (Author:2012)

The exterior spaces of the buildings are found to allow users to engage with the external face of the building. Intermediate spaces such as verandas promote human activities such as sitting. Vegetation and pergola's are elements which further help in creating a transitory threshold. The forms of the buildings while being primarily geometric shapes tend to blend with the landscape as natural vegetation is encouraged to grow upon its surfaces and form part of the experience of entering the building (Figure 82). Through this interaction, the buildings and site obtain a conversational relationship. A respondent revealed a sense of

curiosity when first visiting the buildings as the buildings seen to form part of the landscape and often come as a surprise as one walks along the various gardens.

The Green Hub, on the other hand reflects a different conversational quality through the interactions of the interior and exterior environment. A simple rectangular block is employed and articulated in terms of texture, structure and permeability. The form stands as a rigid element within the landscape, however the permeable central veranda space allows for the boundaries between inside and outside to merge (refer to figure 71). The exterior walling devices are articulated in terms of permeability and texture (as shall be discussed later).

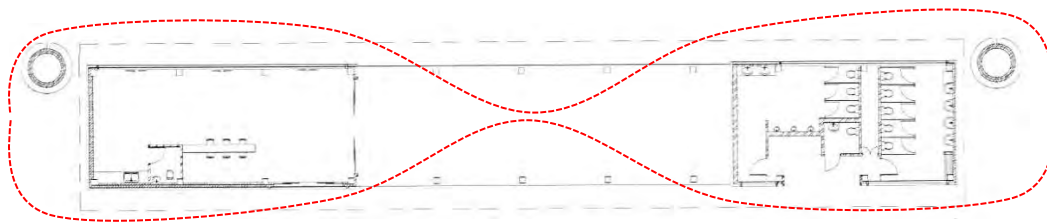


Figure 84 Plan: Green Hub (Hunt, 2011:12, adapted By author:2012) Red lines expressing the merging of interior and exterior through permeable central veranda space.

It was found through site visits that human activity is encouraged within the central veranda and around the landscape, and does not necessarily invite physical interaction with the external walls. This acquires privacy to the internal functions. It is to be noted that the functional requirements of the building is minimal, housing an office component, ablutions and children's demonstration area (i.e. veranda), thereby allowing easier connections with the natural environment.



Figure 85 layout Plan B.D.O House: (Verduyn, 2011:217) Red- courtyard, Blue- circulation core (Adapted by Author 2012)

The functional requirements of B.D.O house by contrast is more complex in nature as here is larger floor area to account for, with spaces accommodating primarily indoor activities. A sweeping curved arm is designed so as to invite visitors into the building (Verduyn,2011: 217), which otherwise appears to lack a sense of "life". Besides the curved line used for inviting people in, all other lines are clean and formally composed.



Visits to the site revealed a disconnection of the buildings functions to the ground level as the courtyard located at basement level separates inside activities from the outside (indicated in red). While the shaded courtyard creates a sense of connection to the natural factors of light and air internally, it has also created a disconnection of a greater extent by limiting physical interaction with the ground level. The internal functions are thereby enclosed and separated from interacting visually or physically with ground level. This may have been done in order to create a sense of focus for the function of concentrating on intellectual activities. However this results in a ground floor level which lacks life and character on the external experience of the building. Furthermore access to the courtyard is through basement level which is used in access and exists from the building and does not tie in as a space which can be used to its full potential. For the most part the courtyard is experienced when using the circulation core where the space is separated by means of a curtain wall, further limiting the full sensory experience of the courtyard.

*Building to earth relationship:*



Figure 86 Building to earth relationship (Author:2012)

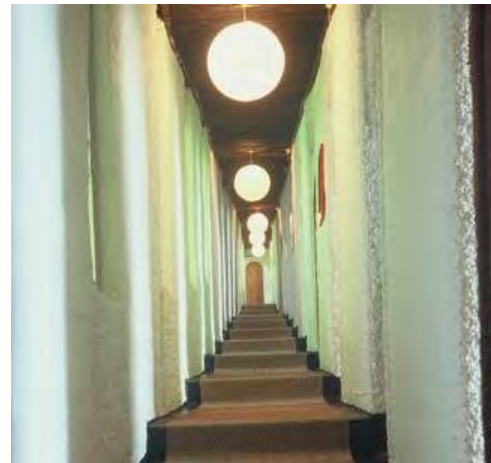


Figure 87 Sense of slope translated into interior (Courtesy of Louis Van Loon:2012)

All three case studies were found to have varying types of relationships with the topography of the site. The relationship of the buildings found at the Buddhist retreat centre was found to have a sense of rootedness and conversation with the topography. Louis (2012: Appendix 1.1) reveals that working with the topography of the site for the construction of the lodge, proved to be both cheap and practical. This approach converses with the natural topography which provides the building a sense of belonging (Figure: 73). The conversation of the building with

the site is then also translated into the interior of the building (Figure: 74), allowing one to be aware of one's general context.



Figure 88 Green Hub: Building to ground relationship (Author:2012)



Figure 89 Green Hub: Building to Ground relationship (Author:2012)

While the Buddhist retreat displays a sense of rootedness, the Green Hub employs a different method, appearing to touch the ground lightly. Wall and ground slab elements do not always firmly meet, as wall elements either float a few centimetres above the ground, transition by means of a permeable block element or meet the ground firmly as illustrated in Figure 88 and Figure 89. This type of approach speaks to a sense of sensitivity and lightness as the building meets the ground. A linear concrete band runs parallel to the ground, reinforcing the horizontality of the building. While the Buddhist retreat and Green Hub display varying techniques of relating to the ground, both are found to create dialectic conversation in the manner that the building relates to the ground.



Figure 90 South façade: BDO House (Verduyn, 2011:217)

The relationship with the ground at BDO house is experience in two manners. Firstly, the manner it relates on the south side and the other on the north side as the building is located on a sloping site. On the south side the building presents a rising up from the ground relationship as heavier materials (stone cladding) is employed at the base of the building (Figure 90). On the north side of the building, the ground level is firstly raised to provide space for the semi basement parking, creating a paved parking platform from which the

building rises (refer to figure:63). The steel sculptural structure which is visually permeable emerges from this platform. The language of the two sides differs as it deals with the sloping site. The lack of vegetation, harsh landscaping and use of “cold” materials presents a rather harsh experience on the north façade (revealed through site visits). The harsh nature of the north façade is found to be pronounced by the lack consideration of activities and human comfort on ground level, rather focusing on coverage for parking concerns.



Figure 91 Buddhist retreat: displaying roof forms (Author:2012)



Figure 92 Green Hub: Roof form (Autor:2012)

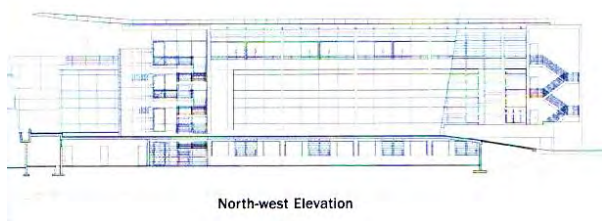


Figure 93 North West Elevation (Verduyn, 2011: 217)

### *Sky to building relationship*

The manner in which the buildings reach the sky in the various case studies can be seen to be influenced by the context in which they are built. The roof forms of the Buddhist retreat employ pitched roofs, varying in texture- thatch and corrugated- as the buildings were constructed in an ad-hoc manner and utilised materials as were available (related by Louis:Appendix:1.1). The imagery of the pitched roof forms speak to the rolling hills of the region and the vernacular buildings found nearby.

The manner in which the roof converses with the sky as found in the Green Hub and B.D.O. House is through crisp clean lines. Such techniques are common in contemporary architecture. The green Hub displays a seemingly floating roof structure as it converses with the sky, which from a distance allows the roof to fade into the sky. This is achieved by creating a transparent band between the wall and roof structure (Figure 92).



Within the BDO House, elements of the sky is allowed to interact with spaces such as the courtyard on the semi basement level and balcony space which leads off the meeting rooms on the 2<sup>nd</sup> floor. The permeable shading structure allows for a connection to the sky, while providing protection from the harsh sun. Roof line appears to be fairly crisp and straight, rising toward the prominent corner of the building. A clear contrast in responding to the sky through roof forms can be seen utilised in the green hub and BDO House (urban areas) in contrast to the Buddhist retreat centre (rural). While the Buddhist retreat roof forms rises up towards the sky, those found in the Green hub and BDO house favour a linear approach.

#### **4.4.2 Findings**

The above discussions revealed that there is no set out rules which defines what the boundaries of architecture must achieve to create a connection to the natural environment, as these responses may vary and there are merits in all types of boundary making. However it can be said that those boundaries which reflect a dynamic rhythm, line, materiality, shape, texture or density, speaks to the human 'life spirit'. This is found to be in accordance to the points put out by Day (2004), Cullen (1983) and Ellin (2006) calling for architectural solutions which reflect dynamic life enhancing qualities as opposed to the monotony of regular grids. Boundaries when reduced to the mere functional and form resolution standpoint, lacks the more intangible aspects which has the ability to create spaces which transcend the functional spatial qualities and begins to inspire and positively uplift a mood of a person.

The Ixopo Buddhist retreat and the Green hub both are buildings which show a considerate relationship to the immediate context they find themselves in. The Green hub displays an almost gentle landing on the ground and a sense of lightness, while the Buddhist retreat displays a sense of growing out of the ground, a sense of belonging. It's important to note that each building needs to respond to their own set of constraints and requirements which define it. Especially important is responding to providing spaces which enable and facilitate the buildings intended activities. The impact of a decision to create spaces which uplift should be taken into consideration. It is also found that the larger context the buildings implications on other spaces and relationships should be considered in the design process as the buildings have implications on the external environment and are not objects to be conceived in a vacuum.



#### 4.5 ECOLOGICAL RESPONSES

Christian Norberg-Schulz (1980) and Kenneth Frampton (1983) suggest that responding to climatic conditions allow a locally authentic form of architecture to manifest. Such responses are in tune with the locality and are achieved through passive systems of design which help in providing spaces which are suitable for human habitation. Response to climate through passive systems is encouraged to allow for diverse creative solutions of architecture which is place bound.



Figure 94 Library space (Author:2012)      Figure 95 Studio Hall (Author:2012)

##### 4.5.1 Analysis

The ecological responses of all three case studies are found to take into consideration elementary design principles of lighting, shading and orientation.

Observation of the Buddhist retreat revealed diverse types of spaces offering varying temperature qualities. This allows the user to adapt to suitable spaces as one feels comfortable. Such variations can be witnessed in the library and studio building (Figure: 94-95). The library is a smaller circular space which sits higher than the airy studio space, this space lends itself to a cosy and warm space in comparison to the large studio space. Buildings at the Buddhist retreat were found to be naturally ventilated and are kept at slender building width. The architect (2012: Appendix 1.1) revealed that steps taken to respond to climate were common sense and in allowing such conversations with climate, the experience

of the spaces are enriched. All spaces are naturally lit but are not overly exposed thereby allowing a fair sense of privacy. The use of white walls helps in brightening up the rooms. Uneven surfaces of the interior walls create changing shadows as light passes through, subtly engaging the user.

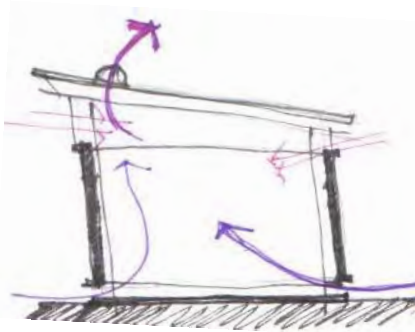


Figure 96 Sketch indicating passive cooling system (Author:2012)

The Green Hub utilises similar elementary techniques as the Buddhist retreat centre but is seen to take a more active role in promoting passive cooling systems to provide comfort. This is done through means of understanding basic airflow dynamics. Respondents revealed (see appendix:1.3) the initial design proposed vented blocks at the floor and wall junction which would allow for cool air to permeate into the building and escape through the vents provided at the roof level, as the air warmed and raised to the roof. However, this technique meant that leaves and soil would easily filter in through these vents as well making the floor messy (as disclosed by respondents). The floor vents were therefore sealed off. Windows serve the same purpose as the vents, when opened, although on a higher level, thus there is a reduction of leaves and soil being blown into the building. Respondents found that the passive thermal techniques worked and there was little need for the supplementary fans provided. Furthermore, the initial system which provided vents at floor level also meant a lack of choice, in terms of allowing the user to adapt to the thermal comfort of the space. Other climatic concerns the building needed to respond to is the cooler winds which blow through the building as the building is located close to the river. Respondents disclosed that the closing of windows and doors provided adequate protection and warmth.

The orientation of the site which BDO House had to deal with in the design process was found to shape the building's design, as it orientated towards the North West. A shading device is therefore employed on the North West facade, so as to reduce solar heat gain and reduce glare (Verduyn, 2011: 216). Ventilation of the building through natural methods is allowed through open-able doors on the south façade. The void at the circulation spine (see figure: 85- blue) allows for air to ventilate upwards and out. The site provides exceptional views to the sea on the south east side. It was found that internal office spaces are designed to maximise views to the ocean, using glazed partition walls interiorly. The south east façade is



Figure 97 Tilted shading device restricting solar heat gain (Author:2012)

mainly glazed and opens out onto balconies which allow maximum engagement with the sea views the site provides, and allows for constant ambient light to filter in. While design employs natural lighting strategies, visits to the building revealed that artificial lighting was found to be needed on a relatively bright day. This may be due to the shading device which helps in reducing heat gain and glare, therefore reducing lighting conditions. Such a case reveals that there often various complex and contradicting factors which needs to be taken into consideration. In such cases one needs to establish which factor takes preference in

relation to the activities the building facilitates.

#### 4.5.2 Findings

All three case studies take into consideration passive ventilation strategies, as has been discussed. It is found that ventilation strategies are relatively easier to apply in smaller buildings with fewer users than in buildings with greater users and functional requirements. Responding to climatic conditions and adapting to provide selective environments give the design details meaning and purpose. It also revealed that there are complex and often contradicting aspects which one must prioritise.

#### 4.6 MATERIALITY, TEXTURE AND TIME

The materiality of the building, as set out the literature review, is an important aspect as it is the basic component of architecture, and through which the manmade reveals itself. The materials, its texture, density and scale have the ability to either draw one into a space or exclude one from a space. Furthermore materiality of the building reveals to the user its history and age, thus allowing the user to feel grounded within the continuum of time (Pallasmaa, 2005: 31-35). Change in nature is inevitable; architecture which allows for the subtleties of time to show partakes in this natural process, developing character and personality.

#### 4.6.1 Analysis

Materiality of buildings can be likened to the fabric of a person's clothes, as it reveals the character and personality of the built form. Materiality as found in the Buddhist retreat, present a sense of honesty and simplicity. There is a sense of unpretentiousness which is felt on experiencing the buildings. Such expression of architecture is rare in contemporary society as cosmetic perfectionist ideals are often favoured. The exterior walls of the buildings are rendered in a rough plaster, which adds texture and play of light and shadow to the buildings, lending an organic line to the form of the building. Louis (2012: Appendix: 1.1) reveals that the roughness of the plaster helps in hiding the faults of the building. Similar to the textuality of Alto's summer house (discussed in chapter: 2.4.3), the rough cast plaster allows for the natural forces to add character and naturally wear. In this manner the external forces of nature converse with the exterior of the building. Louis (2012: Appendix: 1.1) adds that the charm and Guadi like feel to the place is revealed through the subtle flaws which occurred on construction and was allowed to be. The hapticity of the textures of the buildings invites one to be part of the space.



Figure 98 Material pallet: Buddhist retreat (Author:2012)

Earthy tones and natural materials such as thatch, bamboo and wood add a life imbuing quality to the buildings (Figure 98). Gutters, where necessary, are fashioned out of bamboo stalks and add to the natural feel of the buildings. Overall, materials are used in a manner that adds texture and character to the buildings as they weather. Often construction details are exposed providing a sense of understanding of the tectonics of the buildings. The language of the buildings are that of a humble nature, which do not complete with the landscape but rather compliment and fit in with the general sense of the place.





Figure 99 Materiality: Green Hub (Author:2012)

The sense of materiality found at the Green Hub, was found to be earthy and texturally articulated. Brick, concrete, glass, and wood were employed and materials were selected based on their embodied energy opting for the lowest embodied energy where possible (Hunt, 2011: 12). Variation of materials, textures and walling devices, such as timber clad panels, screening devices, brick, concrete and exposed wooden roofing elements, add interest and scale to the building. Furthermore these materials speak to a handcrafted composition of the building. The building being relatively new (constructed in 2011) has yet to show signs of aging or time. The building employs materials which are solid as it is a public building and is subject to wear and tear at a fast rate. The overall use of materials speaks to the natural context, complementing its surroundings in its use of colour and texture. Furthermore the scale and texture of the materiality hints towards a handmade construction, revealing subtle characters.

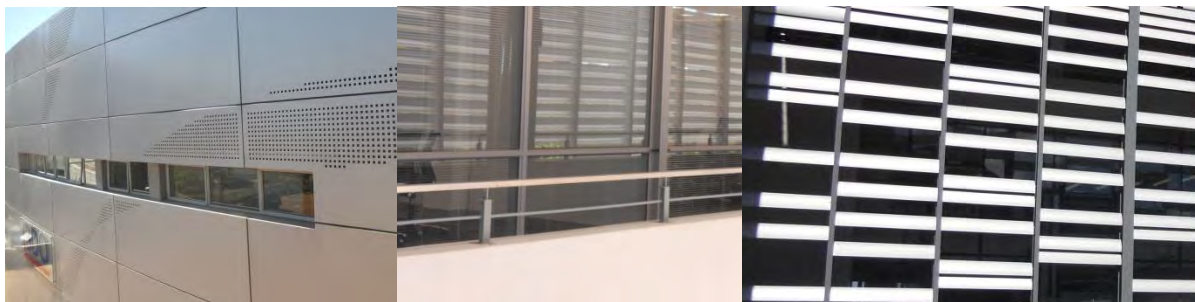


Figure 100 Materiality as found at BDO House (Author:2012)

BDO House by contrast reveals a factory made aesthetic, as materiality of the building is large in scale and uses pre-made cladding panels etc. which are fixed on site. The materials, being relatively new (completed in 2011) do not show any signs of aging as it may be too early to show. For the purpose of an office building, the clean aesthetics of the office buildings maybe justified as a concept which projects an image of effectiveness and precision as business matters are not often emotionally concerned. This however is an ideal which is

concerned with sight and does not responding to the total human experience of the building. Simple considerations, such as colours, textures and devices which add a human dimension to the experience may have been employed to engage the human experience, while maintaining the clean crisp lines which such a building may need to express. Externally, the use of steel and cladding in a similar grey colour exude a sense of coldness. The sweeping arm which is meant to guide people into the building (Verduyn, 2011: 216-7) does not fully achieve its vision as the material it is clad in does not continue the idea of inviting one through. The stone cladding on the south end, adds a sense of grounding of the building and is a welcomed textural quality which engages with the topography. The lack of texture presented by the materials give the building somewhat cold experiences where one is not invited to haptically engage with the building.

#### **4.6.2 Findings**

Materiality as found in the Buddhist retreat and Green hub provides a sense of textuality which engages with the human experience and allows for an inclusive experience of space. Such experiences are found to be in line with the ideas put out by phenomenologists Pallasmaa (2005) and Zumthor (1999). Colours and textures are found to be vital in allowing the exterior of the building to converse with the external landscape. Materiality can be sensed as cold and alienating as can be seen in BDO house or warm and inviting as can be seen in the Green Hub and the Buddhist retreat. For the purpose of facilitating human experiences which invite and include the user, materials should be articulated in a manner which engages the user. It must be noted however that there are no good materials or bad materials, but rather the application of these materials in relation to the human experience is important and needs to be considered.

#### **4.7 LIFE IMBUING ELEMENTS: LIGHT, WATER, INTERACTIONS WITH NATURE**

Spaces which have a sense of life, show subtle variations and use elements such as light and water which allow the mysteries of these elements to filter into a space and add character to the overall experience. Contrasts between shade and light, enclosed and open, low and high volumes and the orchestration of these qualities of space enhance the spatial experience. The play and dramatization of various elements adds mystery and flow into a space. In this manner the subtle variations stimulate the experience as opposed to being monotonous.

#### 4.7.1 Analysis

After experiencing the Buddhist retreat facility, it is felt that the key aspect of the centre is the encouraging attitude towards allowing one to connect to the landscape and allowing the user to become consciously aware of his location and time. Gardens and landscaping provide external spaces full with the delight of the natural world allowing one to engage with the natural environment in a manner which is comfortable and soothing. Elements which allow one to sit are found throughout the landscape, encouraging the use of external spaces. Small and simple considerations such as rock features which capture rain water, encourage birds and other life forms to the area (figures 101-103). The conversational quality of the buildings with their context allows for subtle changes to occur. It is found that the buildings are not too precious about the process of change (2012: Appendix: 1.1). This attitude is found to allow the buildings of the Buddhist retreat centre to feel grounded in their context and partake in the natural processes of change as found in nature.



Figure 101 Zen Garden- Buddhist Retreat (Author:2012)



Figure 102 Zen Garden- Buddhist Retreat (Author:2012)



Figure 103 Opportunities to sit and be part of the natural world (Author:2012)

Within the Green Hub, the main aspect which appealed to the life enhancing quality of space was the quality of light and the lightness of the building. Screening devices and the use of wall elements detached from the floor and ground give the spaces a quality of light and airiness. This mechanism of screening devices work in a manner which allows the darker lit spaces (interior) the ability to look out into the brighter space (exterior), but those in the

brighter lit spaces do not get a clear vision as to what is happening in the darker lit spaces. This technique has been used since ancient architecture, extensively so in the mogul architecture found in India, which allows the sensory qualities of the external space, such as the sounds, light and smells, filter into the space. The buildings transitory nature encourages exploration of the estuary.



Figure 104 Courtyard:(Author:2012)

While the BDO House does not celebrate its external environment, it does present a spectacular life enhancing space through its courtyard. The screening device and the triple volume space, creates a quality of light and shade which changes subtly. The play of light created by this device provides a relief space for the buildings inhabitants and their focused activities. It is a space which allows one to stop and feel the varying sensations of warmth and cold as one moves through the space. The canteen which is provided allows for interaction with this space (Verduyn, 2011:216-7). Another successful aspect of the BDO house is its visual connection to the element of water. Interior spaces maximise views of the sea and is a concept which is stressed in the design concept (Verduyn, 2012:216-7). Such connections to a visually pleasing natural seascape provide relief from the continuous focused activities.





Figure 105 Rain water collection at the Green Hub (Author:2012)

In respect to the use of water as a design generator, all three case studies were found to lack in this regard. It was however found that all three case studies are found to have some connection to water bodies. The green hub is located near the river, the Buddhist retreat is located near a water source which is experienced by means of a walking trail and BDO house makes visual connections to the seascape. The Green Hub, which promotes sustainable energy strategies, collects rainwater from its roof for the use of the building which it stores in Jojo tanks located close to the building. These tanks sit on a pedestal which forms seating. The building stresses self-efficiency and the harvesting of rainwater forms part of this concept. However it is felt that the concept of

collection may have been celebrated in a manner which displays the importance of this life giving source. Such an approach refers to the Crowes (1995) sentiments that both the intrinsic creative human qualities in synthesis with the technological aspects of architecture should be achieved, to add meaning to the built form. Architecture is the transcending of the mere functional requirements into something which can be considered art as it speaks to the human psyche, as related by Johnson (2012: Appendix 1.2)

#### 4.7.2 Findings

It is found that introducing elements of nature such as water, light and access to gardens and other natural life provide a relief to a space. These elements are found to be soothing and uplifting. With current lifestyles being interiorly focussed, it is important to make connections to the natural environments through these means, so as allow the user of the space to rest and ease one's mind.

## **CHAPTER: 5 ANALYSIS AND DISCUSSIONS**

### **5.1 INTRODUCTION**

In addition to case studies conducted, an interview with key respondent Brain Johnson was carried out. This chapter shall, analyse the points put forward in the interview as well as discuss and analyse the content of the research in its entirety. This shall test the hypothesis set out in the first chapter, which suggests that for the creation of healthy, uplifting environments, design solutions which engage with the natural environment is needed. The discussions are set out so as to respond to the key questions put forward in the introductory chapter.

### **5.2 ANALYSIS OF INTERVIEW**

#### **5.2.1 Justification of Interview**

Key respondent Brain Johnson was chosen for his continued research in the field of anthroposophy, also known as spiritual science, which explores the humanistic approach to architecture. Connections to the natural world and the process of creating forms naturally in relation to human processes are themes explored within this approach to architecture. (Refer to Appendix: 1.2 for interview notes)

#### **5.2.2 Key points put forward**

The interview with Brain Johnson (Appendix: 1.2) highlighted various points which are integral in understanding the role of architecture in facilitating connections to the natural environment. Listed below are the key points put forward:

*Context:* Architectural connections to the natural environment are limited to the context and what the site allows. In urban areas such connections are harder to facilitate as there is less natural habitats etc. and a greater density of people.

*Humanising architecture:* leads to a greater connected world. If architecture is to respond to actual human needs, human activities of walking, sitting and conversing, then intuitively spaces which incorporate natural elements are integrated. In prioritising the human, the habitats created automatically look towards creating life enhancing environments. Life enhancing habitats spontaneously encourages birdlife etc. to the space.

*Fragmentation and insular behaviour:* Johnson (2012: Appendix 1.2) points out that plots are often conceived as separate entities demarcated by their pegs. This system causes fragmentation and discards opportunities. If plots are allowed to fuse into one another, then greater relationships between sites may be achieved, which respond in a more organic manner. The box like demarcation of plots is often found to have forgotten unused spaces between plots and such spaces do not add value to the overall environment.

*Community based architecture:* In creating architecture, Johnson (2012: Appendix 1.2) points out that the bigger social context should be considered. That which is good for the greater community should be encouraged. Often it is found, that a certain response may be beneficial to a few yet detrimental to the larger community. Therefore the effect on one and the whole should be considered simultaneously.

*Architecture transcending the mere functional:* architecture surpasses the practical aspect of creation of shelter towards the creation of something meaningful. Meaningful, symbolic, emotional and psychological aspects are considered in the creation of architecture, which is not necessary if the object was to merely create shelter. These aspects of architecture are in relation to humans. Buildings which fail to recognise humans as the central focus and instead centre around the statement of the building is often found to be unsuccessful. Therefore it can be said that it is the human's relationship to the natural environment and not necessarily the buildings relationship to natural environment which comes first. Architecture then becomes the facilitator of providing a balanced connection to the natural environment.

*Not all connections to the natural environment are a welcomed human experience:* Architecture can be said to be between the natural phenomenon and the human being. It is the intermediary and as such it should modulate the natural phenomenon for the benefit of human well-being.

*Values:* every building has an imposing effect on the environment. The vital element to be assessed is whether the building promotes good human relations. The values architecture gives preference too is ultimately felt and affects the greater whole. Therefore the interconnectedness, of our actions should be acknowledged and considered.

## 5.3 ANALYSIS AND DISCUSSIONS

### 5.3.1 Perspective

The research set out to explore how a harmonious connection to the natural environment may be achieved, so as to create meaningful architecture. In order to explore this concept it was first set out to establish what the primary purpose of architecture is. Through the literature review it was established that the creation of architecture is for the benefit of man, in providing man that which the natural environment cannot. The evolution of shelter to architecture acknowledged man's existential needs of expression and belonging. Such responses are natural as they are human nature and ensure the survival of man (Crowe, 1995: 4-5). Johnson (2012: Appendix: 1.2) places emphasis on the creation of architecture which is centred on man's needs. Man's survival depends on the fulfilment of both functional and psychological needs. These needs are complex and often contradicting, as was found to be in the case studies, thus a synthesis between man's functional and physiological needs must be achieved within the built environment. If it is established that architecture is to facilitate man's needs, then for the purpose of establishing a connection to the natural environment, the built environment should facilitate man's relationships to the natural environment for the betterment of man (Johnson, 2012: Appendix: 1.2).

The above discussions reveal that architecture is an intermediate "membrane" between the natural phenomenon and the human being, which either separates or connects man to the natural environment. Since architecture is for the benefit of man, the articulation of such connections or separations must be in relation to the human experience and for the benefit of human wellbeing. The equilibrium of connection and separation to the natural environment is thereby weighed against the functionality of the space and its qualitative needs (Johnson, 2012: Appendix: 1.2).

### 5.3.2 The influence of the natural environment on the built environment

After establishing that the role of architecture is to facilitate the needs of man, the research then explored ways in which the natural environment may influence architectural responses. Place theory, as explored in the literature review, revealed that man's rooting knowledge is established through the understanding of his natural environment. Thus the foundation of culture lies with the intimate understanding of the natural phenomenon in man's local environment. The character of places (sense of place) within the natural world is diverse and

is something which is felt due to its natural circumstances: - the climate, light conditions, topography and vegetation (Norberg-Schulz: 1980). Architecture that develops taking into consideration these local conditions in relation to the human experience was found to manifest strong character which is in tune with the locality, climate and culture. The Buddhist Retreat centre, Africa Centre and San Jose Bank are examples explored which demonstrate such considerations to local conditions.

Conducting the various case studies revealed the understanding that the sense of place is relative to the human experience and understanding of place. As Christian Norberg-Schulz (1980) pointed out there are various felt senses of the natural environment, harsh, desolate, romantic etc., these are human emotive qualities. Similarly the way the building converses with the environment projects a qualitative felt sense. Architectural responses should add to the environment what is lacking for the purpose of human habitation. It was found with the case study conducted at B.D.O House, that there was a deduction from the natural sense of place as there was a sense of desolation. This was found to be due to lack of consideration of exterior human activities or comfort, placing the building as an object on its site. Places found to have a sense of place and those described by Christian Norberg-Schulz (1980); take into consideration the external articulation of architecture to enhance human activities and experience. Seeing as activities are increasingly found to occur indoors in contemporary society, as is found in BDO House, little thought is given to the external face of the building in facilitating human activities or comfort. It may be because of this shift in focus of activities from outdoors to indoors that the lack of sense of place manifests in contemporary architecture. As these shifts to indoor activities occur, architectural articulation of buildings can be seen to move towards form or image based architectural resolution exteriorly, thereby diminishing the sense of place appealing to the human experience.

Additionally it was found that, a greater organic sense of place was found to be achieved, when architectural design is freed from the constraints of technical resolution which are detached from site. The process of intuitive construction free from specifications occurred for the creation of the Buddhist retreat centre as disclosed by the architect, Louis Van Loon (2012, Appendix: 1.1). This process allowed for greater freedom in letting the character of place manifest intuitively in accordance to the natural factors and as opportunities revealed itself while in the construction process. In contemporary practice, this is rarely the case, as

architecture moves towards being entirely resolved on paper and then implementing such designs on site. This approach leaves little freedom to adjust creatively in accordance to aspects of site which may only manifest itself after the design process or is intuitively felt while in the process of construction. Furthermore, the cross fertilisation of cultures and the increase in technological scope have reduced limitations in responding to natural conditions: - climate, local skills and material availability. The easy access to solutions for the provision of human comfort coupled with the wide variety of materials and construction techniques, free architecture from confines of responding to local conditions. This paradoxically deteriorates the diversity within architecture and weakens the organic felt sense of place in tune with the locality. Contemporary environments are seen lacking in regard to sense of place, as the manifestation of character within these spaces are often found alienating, homogenous and not in synch with local culture or climate. Much of this, according to Nan Ellin (2006: 135), is due to the imposition of global ideas and the fast paced nature of contemporary developments.

The concept of critical regionalism seeks to find a hybrid which acknowledges local factors (culture, climate, topography and nature) with global forces (construction techniques, concepts and technologies). Such approach allows the local character of place to manifest, while acknowledging global forces, construction techniques and the time in which we live. In this manner a dialectic relationship with local conditions is established promoting architecture responsive to local, natural and climatic conditions while acknowledging global forces. The San Jose bank explored in the precedent study chapter is an ideal example of such fusion between local and global forces.

The literature covered revealed that architectural responses create micro-climatic changes. Just as a forest or oasis creates within it a micro-climate, architectural form alters the natural forces creating within it micro-climates so to say. If we are to implement the understanding that architecture can modulate micro-climatic conditions in combination with the understanding that architecture is for the provision of life-enhancing human habitats, the built form can be modulated to create spaces which promotes life. Through the understanding of basic thermal and air flow dynamics in conjunction with properties of materials, one may shape the temporal experience of space that uplifts and promotes life. The Africa centre precedent further heightened this concept by illustrating that the understanding of the processes of the building such as waste and water systems can be integrated with natural

ecological systems so as to uplift the environment. Such design considerations can be said to be holistic as it integrates both human and natural needs.

Overall, it was found through the literature in conjunction with the case studies and precedent studies that the following principles, when applied to architecture derive meaning from the local natural environment and natural forces:

- Response to climate- adding to the environment what is lacking thereby complimenting it
- Use of local materials where possible
- Incorporation of cultural aspects through demilitarization/ abstraction
- Dialectic approach to site-working with the levels of site
- Integrating the buildings processes with the ecological systems so as to enhance or uplift the environment
- Modulating natural light to facilitate conducive spaces
- Intuitive design , developing architecture in a slow and sincere manner, allowing site idiosyncrasies and opportunities to show itself

### **5.3.3 Nature and the city**

As architecture moves towards the urban scale, issues regarding the natural environment become complex. The creation of towns and cities is due to man's natural cultural evolution as is related by Crowe (1995). The primary purpose for such developments was for the benefit of the greater whole, the formation of community, providing a sense of security and belonging. In addition there are a great number of advantages as there is an increase in amenities that the community may benefit from. From the literature review it can be deduced that the city has evolved in a manner which:

- *firstly*: strayed from its rooting resolutions of community and life enhancing habitats
- *secondly*: disconnected man from the natural forces, processes and phenomenon of the natural world, leading to ecological harm

The rooting resolutions of the city were for the benefit of the greater whole, providing a sense of community, security and belonging. Cities which succeed in providing such sense of place are found to be those which promote the sense of being within a place, providing a sense of



belonging. Modern day cities are found to be in stark contrast to these rooting resolutions, as the contemporary built environment demonstrates an economic, scientific resolve. This brings to the fore materialistic values, desensitising our humanity and ability to develop human relationships (Johnson, 1993:24).

The aforementioned approach to design, limits the communal involvement and creative power of society as a whole, imposing on their creative freedoms by providing stiff environments that lack appeal to the human spirit. Such environments are said to lack 'life force', 'flow' and harmony. The ecological success of a habitat is often assessed on its ability to sustain life, similarly human habitats should be assessed on these bases, providing spaces where life flourishes and mirrors the complexities of life (Ellen, 2006: 142).

The literature revealed that city developments which dominate the natural environment and lack an integrated approach with natural habitats create a toxic environment for habitation. If we acknowledge that architecture is to enhance the environment and add to the natural environment what is lacking for the provision of life, we may deduce that most contemporary environments fail to achieve life promoting environments instead creating machine like cities devoid of life. Seeing as most of the world's populations now live in cities, it is vital that the design of city environments provide spaces which are life enhancing, as opposed to life draining. Most of the effects of lack of natural integration are unseen but noticeable. Some of these effects are: - the increase of air pollution leading to respiratory illness, increase in noise pollution and incessant stimulation of the mind, creating mental illnesses, mental fatigue and stress related illnesses and increase of temperatures due to urban heat phenomenon. However from the failures of contemporary city environments there are lessons which one may draw. The most noticeable lessons are the collective power of architecture to influence the general environment; context based architectural responses and the importance of creating connections between buildings and the natural world for the creation of authentic place.

In regard to integrating natural features within the urban precinct, as is recommended by ecological and integral urbanism theories, this field is found to be primarily related to the town planning field of study (Johnson, 2012, Appendix:1.2). However, architectural design does have a part to play in creating spaces which are life enhancing. If life enhancing spaces are created, then it follows that natural elements such as bird life etc., are attracted to such life enhancing spaces. The discussions regarding nature and the city reveal that a balance between civic and ecological values is needed for the promotion of healthy human habitats.

Re-occurring within the research is the theme of humanising spaces. It is found when the human experience is given preference; life enhancing elements of the natural environment are easily incorporated. Spaces should therefore be thought of in terms of human experience of space interiorly and exteriorly, and the scope of users. Often it is forgotten that the city accommodates a range of people and activities. Hence a range of spaces with varying scales and mix of activities should be encouraged to evolve naturally, so as to provide for the diverse range of people. This concept is found within integral urbanism strategies and is found to correspond with the thinking of Johnson (2012, Appendix:1.2), who states that man is a creative being and it is this creativity that makes our world exciting. Therefore architectural creativity should not be limited to the urban designer or architects, rather naturally occurring synergy through everyday man's creativity should be encouraged. Such an approach encourages authentic spaces to emerge in tune with local culture.

The city in its totality can be viewed as a central hub or brain so to say. This hub controls resources and communities within its radius, as well as in far reaches of the globe as communications and travel technologies free us from natural limitations (Girardet, 1992: 20-24). Decisions made in the city, affect the lives of millions and affect the faith of natural resources and the biological world. It has become easy to disconnect ourselves from the realities of our decisions, as we have developed an out of mind out of sight mentality. Science has revealed to us the interconnectivity of all things on earth yet our actions do not reflect this understanding (Berry, 1995: 8-10). It is therefore recommended that education and awareness regarding the natural world be encouraged within city environments so that we may instil respect and love for the natural environment thereby protecting it.

#### **5.3.4 Building design and the natural environment**

As lifestyles and activities become increasing indoor based, it is becoming increasingly more important for architecture to facilitate connections to the natural world. In facilitating human connections to the natural environment, it must be stressed that the primary connection being facilitated is between man and the natural environment, it is the building which facilitates said connections keeping in mind the functional requirements of space and the wellbeing of man.

There are various strategies which one may employ to facilitate human connections to the natural world. The aspect of ecological response to the natural environment is found to be re-

occurring within concepts in both place theory and ecological theories. Engaging with the natural environment to selectively alter the natural forces to suite human comfort is found to add meaning and depth to the interior spaces. With the availability of technological solutions which alter interior spatial qualities, designs are not limited to the natural limitations thereby reducing creativity in designing place bound solutions. The literature revealed that passive solutions are found to be more stimulating and healthy in comparison to mechanically induced environments.

As activities of the 21<sup>st</sup> century become increasingly focused, intellectual and indoor based, layouts of buildings should encourage interactions with the natural environment where possible. The Buddhist retreat centre displayed an approach which requires people to move through the landscape from one function to another thereby allowing the user to experience the flows of nature. Often designs tend to “over-shelter” people, it is found that a certain degree of vulnerability is good, as it is stimulating and allows for a varied multi-sensory experience of space. Furthermore, being part of the external environment allows one to place oneself within time and space and consciously bring an awareness of being of the here and now (Van Loon, 2012: Appendix: 1.2). It is found that activities which require a less functional requirements, allow for a greater degree connections to be made. Spaces such as circulation routes, canteens, lounges etc. have greater potential in creating spaces which allows for connections to the natural world, through gardens or incorporation of natural elements. The provision of connections to the natural environment along circulation routes as found in the Buddhist retreat centre and BDO House allow one to loosen the tension between intense focussed activities. Incorporation of such strategies within buildings with intensely focussed activities help in providing relief to the user’s experience. Visual connections to natural spaces as found in BDO house can also be used as a strategy which alleviates the strain of a constantly focussed environment. Beathly (2011: 1-6) points out that our environments have become overly focussed. To achieve *flow* a balance between intensely focused and relaxed spaces must be achieved.

Physical interaction with natural landscapes is not often possible due to certain circumstances such as context or functional restrictions. Here symbolic connections to the natural world may be achieved. It is found that it is not constant physical interaction with the landscape which is needed but a dialectic conversational approach. Natural cycles of celestial movements, change of seasons etc. provide a stimulating and varying backdrop for which

human life may play out. Architectural approaches should consider these aspects to create spaces which celebrate the natural world, and allow the user of the building to become aware of these natural changes. These aspects of the natural world lend spaces a mystical quality which should be explored. In the case of the Buddhist retreat centre, the provision of various gardens allows one to observe and be inspired by the natural world. The variation of shade and light as found in BDO House courtyard was found to provide an enriching experience as the quality and intensity of heat and shade subtly changed. Such initiatives begin to converse with natural forces and in doing so uplifts and enhances the human experience.

Case studies in conjunction with the literature found that the articulation of the form of the building is vital in connecting to the external environment and the topography. Relationships which converse with the natural environment are found to manifest a sense of place and belonging as opposed to those which impose. Forms which are dynamic in relation to the human experience connect the two realms of inside and outside, blending between the two realms. The manner in which the building sits in its context conveys the attitude towards the environment. Buildings can be found to be rooted in their context, lightly touch the ground or park and impose on the natural topography. These aspects add to the qualitative feel of the space. Line, form, texture and density are found to be elements which should be carefully considered for the creation of architecture which reflects similar life dynamics as found in the natural world.

It was found that materiality plays an important part in either connecting or separating one from his environment. The manner, in which materials are used in conjunction with its form, has the ability to invite one towards a space or excluding one, become rooted within a context or appear alien. Furthermore the materiality of a building is the substance that allows the character of the building manifest. Properties of materials should be well considered, as it can be utilised in a manner to mould the qualitative aspect of space, utilising external natural flows to shape the environmental quality of the interior space. A selective environment is thereby created to meet the thermal comfort of man through passive means.

To induce life enhancing qualities within the built environment it is found that elements of light, water and views to elements of the natural world provide such qualities. The life enhancing aspects of these elements lie with their variety, diversity and ability to subtly change. Creating spaces which incorporate and mould the experience of space with these

elements in mind infuse the space with movement and life enhancing quality which speaks to the human soul. Such opportunities are often found to be trivialised within contemporary architecture as it goes beyond the practical functional requirements.

The incorporation of spaces such as gardens and landscaped areas integrally located within the spatial layout of the building allows man to interact with an ordered form of nature. Natural imagery has influence man from the beginning of time and represents peace, tranquillity and contentment. In contemporary society such connections are needed to counteract the overstimulated and focused lifestyles lead. The incorporation of gardens and landscaping elements within the man-made world unites nature and culture through order of natural vegetation, thereby facilitating a co-existence. Spaces which allow for the observation of nature makes one aware of place and time, linking one to the larger world.

## CHAPTER: 6 CONCLUSIONS AND RECOMMENDATIONS

The study set out to examine how harmonious connections to the natural environment may be achieved and to test the hypothesis which states that, for an environment conducive for human wellbeing and upliftment, architectural spaces which are integrally connected with nature are needed.

Firstly it was established that architecture provides man with that which the natural environment cannot. Therefore the alteration of the natural environment is to provide man with life sustaining spaces. In understanding this, the built world must establish spaces which attend to human needs both physical and psychological.

It is found that to provide for man's existential need of belonging, there needs to a sense of place, so as to root man in his context, giving him meaning and an existential foothold. Architectural responses which create a conversational relationship with the natural environment and compliment the natural climatic factors are found to have a greater sense of place. In the manner of conversing, the built forms take into consideration human needs and activities and adapt to suite climatic conditions to provide life sustaining spaces. It is in considering the human experience on both the external face and internal face of the building that allow a sense of place appealing to the human experience to manifest.

In considering spaces which are attractive and life enhancing to man, it is found that these environments are similarly attractive to other life forms in the natural world, such as bird life, butterflies etc. Hence if the qualitative feel of the space is life enhancing, other life forms and natural qualities follow. Environments which are life enhancing are said to be in *flow* or harmony. The qualities of such spaces reflect dynamic lines, variation and diversity, are stimulating but not overly so. Such qualities of space are easily found in the natural world. Architecture may take inspiration from the natural world for the creation of such spaces which appeal to the human spirit.

While man's achievements in the technological world is great and has been for the betterment of humankind, scientific paradigms have set man apart from nature and as such desensitised ourselves from the natural environment. In order to reconnect the man-made world to the natural, conversation and celebration of the natural phenomenon is needed. Such connections allow one to feel connected to the greater world.



Architecture is an art which orchestrates human experience of space and facilitates man's needs. Materiality and articulation of the membrane which separates the interior and exterior are important aspects to consider in relation to the human. The manner in which these elements are articulated may act as either a connector to the natural environment or a membrane which excludes one. It is therefore vital that the articulation of such elements be considered relation to the human experience.

Often it is found that in addressing ecological problems technological solutions which are additional add-on's to the buildings structure is utilised. What is needed rather, are creative solutions which integrally realise the built form and the natural world as one, where design solutions benefit both the natural environment and the needs of humans through the built form. Hiroshi Sambuichi (2011) elegantly sums up the benefit of this holistic approach stating: *"People too, I learned, are an aspect of the environment. Designing a building that is 'for the good of the environment', results in a building that is 'for the good of the people'."* (cited: Hashimoto, 2011: 97)

As the world continues on its part of logic and reason great amounts of biodiversity is lost due to expanding towns and cities and man's extensive domineering attitude towards the natural world. This scientific and logical paradigm encourages economic and materialistic values resulting in an increasingly homogenised world. It is therefore becoming increasingly important to advocate the importance of diversity, both in the natural and cultural world. Culture to some extent, may be considered a natural phenomenon that exists and develops in a specific natural habitat and as such it grew to be specific to that region developing human values and cultural identities integrally linked with place. Eradication of these local solutions causes greater harm to the social structures of a place than it does good. Therefore a holistic paradigm is encouraged, which understand that all things on earth are interconnected rather than disassociated parts.

It is found that greater awareness and education regarding our natural environment is needed to enable society to respect and enjoy the natural wonders of our world. Limited interaction with the natural world and increased indoor activities leads to a society disconnected from the realities of the natural world. It is therefore recommended that facilities which promote a culture which places value on environmental concerns over individual capitalistic approaches be encouraged. Such places which can inspire both children and adults alike. It is time

designers react to the intuitive yearning for connections to the natural world, which inspires the body and soul, as Linklater states:

*“The problem for us is that words seem attached to ideas and detached from instinct. Feelings, attached to instinct and experienced physically have to struggle for verbal expression because words seem to belong not in the body but in the head. The mistake has been the banishment of words from the body.”* (Linklater 1976, 172, Cited: Bixby: 2009)

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## APPENDIX

### APPENDIX: 1.1 CORRESPONDENCE WITH LOUIS VAN LOON

Hi Zakiya,

Thank you for your interest in the architectural design and layout of the Buddhist Retreat Centre. As an architect and structural engineer with more than 50 years of practice covering the entire field of architecture and engineering, it was a surprise to find that when it came to designing the layout of the BRC and constructing it, my methodical research and supervision I usually employ on my clients' projects deserted me. I had a broad idea of what was needed, but once I moved on site I was prepared to be surprised by what it told me. Apart from the usual concerns such as orientation and access etc, there were three hills to consider which sloped in various directions with streams between them; plantations of Wattle trees which needed to be kept going; an existing shed that was asking to be incorporated purely because it saved money., etc. Even when I had made up my mind where to place certain building's, and had started excavations on some of them, I changed my mind during lunch break and came back to my workers and told them to start somewhere else altogether. Where did that come from?

Most buildings were conceived in such an ad-hoc manner. I think I simply responded to the organic, Feng Shui nature of the site without intellectual interception. Lunch time seems to create the right conditions for that... For instance, plenty of mistakes were made by my workers in my absence: building walls that were horribly out of alignment and leaning backwards, forwards and sideways, window and door openings that were not trapeziums; and floors at the wrong levels. With very few exceptions, I found ways of incorporating all these flaws - which in retrospect happen to add to the charm of the place. Some of it has a Gaudian look about it. The buildings therefore have a certain brazen, unapologetic quality about them - as if to say we are not trying to be precious about how we look. Like a woman who can look so arrestingly beautiful with her hair all wet and her mascara running.

Many of the building materials, and even entire buildings, were bought at auctions, such as roof sheeting that came off railway sheds that were being demolished. The BRC office and dining rooms were old prefab school buildings that went on auction because they were being replaced by permanent structures, etc. I paid R. 750 for both of them.... I just tacked chicken mesh onto the outside cladding and plastered everything with rough-cast plaster like all other

buildings. I discovered that rough-cast plaster - (if it is spectacularly ROUGH-cast) hides all building sins very attractively. I had no money to buy window and door frames for the Lodge and Meditation Hall so I simply nailed strips of tempered hardboard into the brickwork into which the glass was fitted with glazing beads.... All this was done unthinkingly, on the spur of the moment, as the idea arose in me.

Those were lovely experiences to have - to be freed from the narrow confines of meticulous planning and specification that usually characterises our profession. I realised later that all this was in perfect accord with the eastern philosophical ideas you find in Buddhism and Taoism: naturalness, spontaneity, simplicity, absence of preciousness and ostentation, etc.

When I had decided to relocate the Lodge during my lunch break, I walked around the property for a short while and decided to build it on a sloping hill. This would normally entail creating a level platform to build this 65 m. long x 6m wide building - work that would entail massive earth moving, and lots of money - which I did not have. As my workers were waiting for instructions to start digging again - somewhere; anywhere - I paced out how much downhill the building would stretch and decided to level a platform for the last room and then the next room further up the hill and so on, one room at the time, climbing up the hill all - at varying levels. I decided to figure out later how one would gain access to these rooms. This became obvious as the building progressed up the hill: a passage alongside the rooms would follow the original contour of the hill and therefore had to have a gradient and incorporate an occasional step to suit the floor level of each room. The roof, of course, could now also slope down at a continuous curve - parallel to the slope of the hill, and discharge storm water at the lowest end of it, simply cascading off the edge of the roof into a stone trench.

I attach a picture of the passage. We have often found that a visitor has booked a room in the Lodge, but when they arrive it is obvious (from the car they drive and their demeanour) that they could easily have afforded far more comfortable accommodation - such as our thatched self-contained chalets, with their own bathroom, viewing deck, dressing room, tea/coffee making facilities, etc. But when they are offered such accommodation they politely refuse, saying that they always stay in 5-star hotels but they love coming to the BRC because it makes them experience simple, ashram-like conditions. Sharing bathing facilities makes them feel integrated in a like-minded community - which they rarely do, or wish to do - anywhere else.

### **Questions:**

1. The components of the retreat are placed separately within the landscape as different functions as opposed to a clustered organization of functions. This approach was found to encourage the user to explore the landscape and the various gardens. Was such an approach intentional, briefly describe why?

Yes, this is broadly true. When people come to the BRC, having moved out of their comfortable cocoons of suburban homes and offices, I felt it would be good for them to undergo a change of habits and environments, such as you do when you go on a picnic or safari, except that at the BRC we also create a conscious, philosophical context for such a shift in one's experience of where you are: more acutely here- now. People are forced to walk in the cold and mist, rain and sunshine, in the dark with torches and feel vulnerable to their surroundings instead of being constantly shielded from them.

2. Is there a design philosophy which you adhered to, briefly describe if any:

A very loose and spontaneous one, as described above.

3. The feel of the buildings evoke a sense of unpretentiousness and humbleness, something which contemporary design defames and suppresses, yet this sort of approach appeals greatly to the human spirit. Where these aspects intentionally done? What are your thoughts on form making which places great emphasis on formal resolution as opposed to the experience of the building?

Yes - see my general attitude described above. When I visit tiny Greek or Italian villages, built in random fashion hugging their environment and with the homes trying to keep a respectful distance each other not too far away, though), my spirits soar with a sense of belonging. I don't have that in the most thrillingly designed architectural wonders in our modern cities: those buildings and streets make me feel alienated which tell me I need to go somewhere else in order to really feel my human spirit. And yet - I am responsible for a fair amount of such a hostile environment - but didn't want to repeat that at the Retreat Centre where I had no constraints to follow someone else's notion of what they want - or what is profitable. But often architects design even their own houses as showcases for how good they are in contemporary design

even if they would rather live in a more human and truly charming environment that make you feel romantic.

4. The roof forms, some are done in thatch, while the others are in corrugated roofing, is there any specific reason for the variation?

No - whatever happened to be or become available or proved the most economical. Remember - I had no image to keep up or theme to follow: just what came naturally, effortlessly.

5. What, in your opinion is the greatest success of the buildings and is there anything you would have preferred to do differently?

The buildings have proved to be successful for what I thought at the time they were going to have to do. They were experimental and built at different times. As the BRC developed its personality these buildings needed to be altered and adapt to changing circumstances. New buildings too responded to whatever we felt was needed at the time and for the foreseeable future. The buildings were not built to make a statement that was intended to last for centuries - like the cathedrals of old. Buddhism's principal focus is to flow with impermanence, change; not resist it. I have always kept this in mind with the buildings as well. It stops you from being too precious about the things you have created. - Because they should be allowed to change.

6. How did climatic considerations affect the form of the building, if any?

As an architect/engineer one cannot help keeping certain elementary design principles in mind, such as lighting, shading and ventilation etc. But these make common sense anyway: they were practiced by the early Greeks and the Romans with their internal courtyards and by other civilisations living in climates that made thick flat mud roofs useful. If you open yourself to the environment - instead of imposing yourself on it - one is often surprised at the feedback.... Think of the lovely veranda houses built in South Africa in the 19th. Century. These took over the design principles used in the colonial houses built in India and other countries where a typical Tudor or Victorian house proved unsuitable.



## APPENDIX: 1.2 INTERVIEW NOTES WITH BRAIN JOHNSON

Conducted on 18 April 2012

How does one facilitate connections to the natural environment through architectural design considerations?

Firstly depends on the site. If it's in the city, it becomes more difficult, because you have a totally manmade situation. If you took the city as the centre of a circle and you moved further away towards the outskirts towards the greater natural environment, you find every condition between one and the other, and you can only do what the site and context allow.

New urban design paradigms suggest finding a balance between man and nature through rehabilitation in urban areas, what are your views regarding this?

If you lucky enough to build next to a park, I'd agree with you, or on a river. But this isn't the context of many cities. The Umgeni River doesn't go through the centre of the centre, though it usually did cut through to the point area. This is a town planning and urban design aspect; architects have fewer jurisdictions in this regard. Unless there's backing at that level, rehabilitation cannot occur. Also there are great cost implications of such a project and resistance may be met by traffic planners.

99 percent of natural and urban renewal in terms of natural renewal needs take place at town planning level. We had put forward a proposal to pedestrianize west street from gardener, right up to Aliwal street, and were met with great opposition from the traffic department, when the matter was investigated and alternative solutions provided. As soon as spaces become humanised and pedestrianized, the introduction of vegetation and natural elements are easily incorporated, if not, the most you can do is place rows of trees, not really incorporating natural elements as its sparse and merely ornamental, (optimised for cars, not humans) though it does humanise it to some degree.

Similarly in the suburbs, plots standardly divided up in sizes, the further away from the city, the larger the plot. Very few instances which allow the plots to fuse into each other, so this is where the gated communities are becoming important where there's more opportunity to blend sites together, because they have common ground, and there isn't a barrier in between, so the landscape tends to flow through in a more organic manner

Is this fragmentation due to regulations being too restrictive perhaps which leads to such a vast difference between historic and contemporary cities?

The difference bet old and new, historic may be due to the plot size being small which led to greater connection. Human scale- old cities, restricted by technology, they therefor could not build vertical cities like we can. We've freed ourselves from the limitations of natural materials. And if you build sophisticated cities then efficiency becomes paramount.

Need to be careful of labelling certain generations, good or bad, need to take into consideration the time context, as they had different restrictions and different social contexts.

Three main initiatives to humanise cities:

1. Greening cities- every possible space available, maximising it
2. Walkability
3. Scale

Firstly one must establish priorities, who is the built environment meant for? We build for the human being. We do architecture to take building beyond shelter, to make it something which is meaningful. Meaningful, symbolic, emotional and physiologic, these elements aren't necessary to provide shelter

One needs to ask why it is necessary. Should we be doing architecture? Why not just provide shelter?, and it's because we've provided shelter for many years and it's been recognised that it isn't enough. People don't survive in a healthy way if the provision is just shelter. It's exceptionally harsh and that is why people have developed ways to live in communities.

With that change there more situation of architecture developing. All the architecture that has gone the way of just making a statement about the building or the form of the building has in many ways proved to be unsuccessful, as it is centred more around the building rather than the human being.

If you subscribe to the philosophy, that architecture is to serve the human being. If that's the philosophy then the architecture will be as human scale and reflect architecture in proportion to the human, in doing that, you then need to understand the human being. In this regard, it is the human's relationship to the natural environment and not necessarily the buildings relationship to the natural environment that comes first. If you can fully understand that

relationship, then you can start to build architecture that facilitates a balanced connection in relation to the human. The building comes in between.

Seeing as humans have their own set of needs, functional and Psychological which often means creating barriers between ourselves and the natural world, how do you suppose a balance environment may be achieved?

Not all connections to the natural environment are good in relation to the human relation, so it's the context of the situation. It's about creating a balance. You don't really understand it from a buildings point of view, but rather a human's point of view. The building facilitates and moulds the experience.

All design should go back to first principles- which bring us back to the human. Human beings are the key element. It's all relationships as they relate to the human being.

Architecture can be said to be between the natural phenomenon and the human being, something which connects segregates. It's the intermediary. Decisions are made on how architecture modulates the natural phenomenon for the benefit of human wellbeing.

Among the trends in current urban design is the introduction of vertical gardens etc. for the greening of the city, what is your opinion regarding such trends, do such methods inhibit the image-ability of the city and possibly confuse people?

Any attempt to bring qualities of natural elements is good in one way. There's no bad concept or material, it's the way in which it is used. Planting should be considered in its entirety and its micro-organisms. It's not wrong, though they may be better ways of utilising it.

Materiality- concrete for instance in the brutality period- didn't enhance human emotions, the context in which things are used in relation to human experience. There isn't a sweeping good or bad. The only way you can assess, is through weather it helps to bring out man's humanity and human development. Not that it's bad, but that it does not promote human development. Architecture should always keep the big picture in mind. Keep in mind who it is serving.

The human because of ego and spirit, has the ability to create freedom and creativity. It's the transcending, in terms of how we create shelter into architecture. Creativity is what makes us

different from other species. Whether the expressions of our creativity are good or bad is subjective. And it is this creativity that makes our world exciting (variation).

How architecture can serve the human, physically and physiologically- the synthesis of that should create good architecture.

How the natural environment relates to the human activities, in relation to the functionality. Every situation requires a varied balance. More concentrating activities should not distract one.

Different equilibriums for different functions, for the purpose of developing our humanity

Architects have a social responsibility and an ecological as most of our time is spent in the built environment.

Keep in mind the bigger picture

How do you suggest finding a balance between blending with the natural environment and standing out and making a statement?

There are times where building needs to stand out, for the purpose of orientation and celebrating community activities for instance.

It's too simplistic to say buildings should blend with the natural. Every building imposes and develops a relationship. The vital question is whether this relationship is a healthy or detrimental. Is it good for one, but what about the greater whole? the society. The bigger picture always important, as what maybe good one may not necessarily be good for the greater whole.

There are certain things you can distil from a study like this, such as: Everything is site specific, yet connected to the bigger picture.

What it all comes down to is values ... which values we place greater emphasis on is the one which is reflected in the built world.

## APPENDIX: 1.3 QUESTIONNAIRE GREEN HUB

Respondent: Anonymous (reception staff member)

1. Does the building provide adequate thermal comfort or do you prefer the use of mechanical ventilation to provide optimum room temperature?

The place is fine in term of temperature. We have vents to aid cooling the place, which work well.

There used to be vents at the bottom at floor level, if you have a look, you can see that they have been filled up. It used to blow in dust and leaves in from the vegetation on the outside.

We do get cold winds blowing in, because we situated closed to the river, but if the doors and windows are closed it's not too bad.

No, we do not have any air-conditioning units, we do have fans, but it's rarely needed.

2. What elements of the room would you change if you could, and why? (Height, shape, colour, texture etc.)

I think its fine. It is a nice place to be in because of the wooden furniture and it's nice and airy and light. I think its fine.

3. Do you prefer natural lighting or artificial, does it make a difference to how you feel in the room?

We have a nicely lit space because of the glass at the top. It feels like you outside but sheltered which is nice.

4. Do you think having connections with the natural forces (connection to the exterior environment, the weather, time of day, seasons etc.) is vital for wellbeing? If so, do these spaces provide such connections?

Yes, it's a nice place to work in, because it's nice and peaceful and u can look out to the outside. We are situated near the bridge, but the noise isn't heard so much in here, it's more the birds and wind rustling the trees.

## APPENDIX: 1.4 BUDDHIST RETREAT INTERVIEW

Respondent: Anonymous (Visitor to the centre)

1. What is it that you like about the place in general?

It's nice and peaceful here. It's a big contrast from everyday life; it just centres you, lets you be. The surroundings are calm and serene

2. What sort of spaces did you enjoy?

The gardens are quite nice to sit and just listen to the sounds, to read a book under the shade or even take a walk. It's refreshing. The views of the hills quite something too. The deck at the river is a nice place to visit.

3. What are your feelings regarding the buildings?

Non-existent. They are part of the landscape; they seem to be one with gardens and landscape. The pagoda element on the hill is the element which stands out.

4. Are the buildings inviting?

There was a sense of curiosity and interest going into them. They form part of the landscape, so it feels like a surprise at times when you walk around. The focus seems to be more the outside and the buildings are part of it, shelters amongst the gardens.

5. Regarding the library space, could you describe the feel of the space?

A very earthy, comfortable space. Good for when there's group discussions, it allows people to engage with each other, with it being circular. The colours and wood and carpet finish makes the room feel warm and inviting.